User Manual

Using Privacy-ABCs for privacy-respecting course evaluation

www.abc4trust.org

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1 Introduction

1.1 Purpose

Course evaluations are a standard practice in Greek universities and are supported by the Hellenic Quality Assurance Agency for Higher Education (HQAA). The purpose of HQAA is to ensure the transparency of the evaluation procedure and also to guarantee that these procedures will be used in enhancing the quality of Higher education. However, up to date course evaluations in Greece are conducted on paper and they are done after class inside the lecture room. This unfortunately hinders the whole procedure, since the students need to put a lot of trust in the fairness and privacy practices of their university.

As part of the ABC4Trust project that is supported by the ICT Programme of the European Union students and professors of the Computer Engineering and Informatics Department are being asked to participate in an online Course Evaluation system. More specifically, the system scope will be the realization of a trial where university students can anonymously rate courses they took while ensuring that:

1. participants are valid University of Patras students
2. participants are students that have indeed registered to the course and have had sufficient attendance and
3. participants can only rate the course once, without keeping list of students who have already rated the courses, so as to protect student anonymity.

The Computer Engineering and Informatics Department has the opportunity to introduce to the utilizing students and professors via the Course Evaluation System the Anonymous Based Credentials (Privacy-ABCs) technologies and to enable their efficient/effective deployment in practice.

This manual will give students, professors and other education officials all the information they need to incorporate the Privacy-ABCs for online course evaluation in the Computer Science department of the University of Patras.

The manual addresses the following key content areas:

1. A generic information about Privacy-ABC technologies and the ABC4Trust Project (see Subsections 1.3 and 1.4)
2. Description of Anonymous Course evaluation for certified students (see Section 2)
3. A step-by-step description of how the course evaluation system operate and interact with its users (see Section 3)

1.2 Overview

In Section 2, we give a description of Course Evaluation System for certified students. The University Pilot will take place in the Computer Engineering and Informatics Department of the University of Patras in Greece (see Figure 1). This is one of the most highly esteemed departments related to computer science in Greece. It is located very near to CTI premises. For the purposes of the University Pilot, a group of 60 students will take part in the evaluation of the following course:

1. Distributed Systems I: This is a non-compulsory course that takes place at the 7th semester and the number of students that attend it is approximately 60.

Figure 1: The Computer Engineering and Informatics Department

CTI will be responsible for formatting the group of students that will participate in the University pilot. The major challenge for University Pilot is to ensure anonymous participation in a course evaluation which enables multiple evaluations (the last one will only be counted) and ensures unlinkability and confidentiality. In particular, the participated students will have to do the following steps in order to evaluate the two selected courses in a way that ensures the credibility of results and preserves the privacy of the students expressing their opinion:

1. All the participated students will have in their possession a smart card (see Section 3.1).
2. Each student will set up his PC (see Section 3.2).
3. They have to register their smart card (see Section 3.4).
4. Then any student can be registered at the Computer Engineering and Informatics Department University or pick a course by using the Privacy-ABC technology (see Sections 3.4, 3.5 and 3.6). In the cases where a student leaves the University or loses his SC then the administrator has the authority to revoke a student's University credential.
5. Any student can check the validity of his stored University Credential (see Section 3.7).
6. All the students that will take part in the evaluation can collect their attendance information at each lecture (see Section 3.8) and they can view their attendance units (see Section 3.9).
7. Each student can back up his attendance information and to restore backed up data on his (new) smart card (see Sections 3.10 and 3.11).
8. All the students can view and delete their stored credentials (see Section 3.14 and 3.15), change their PIN of their smart card and unlock it (see Section 3.12 and Section 3.13)
9. They will prove that they are indeed students of the department offering the course, they are registered to the course under evaluation and they have attended sufficient number of lectures. In order to submit their course evaluation (see Section 3.16.2).
10. They also can prove that they participated in the course evaluation, in order to have access to a Tombola lottery (see step 13 of Section 3.16.2).
11. A participated student in lottery will win a prize. A student will be randomly chosen in order to be the Inspector. When the lottery ends, the Inspector will announce the winner (see Section 3.17.2).

1.3 Attribute-based Credentials (Privacy-ABCs)

Recently, much research has been done towards developing a number of technologies for building Privacy-ABC systems in a way that they can be trusted, like well-known cryptographic PKI certificates, while at the same time protecting the privacy of their holder (e.g., hiding the real holder's identity). Such attribute-based credentials (Privacy-ABCs) are issued just like ordinary cryptographic credentials using a digital (secret) signature key. However, Privacy-ABCs allow their holder to transform them into a new token, in such a way that the privacy of the user is protected. Still, these transformed tokens can be verified just like ordinary cryptographic credentials and offer the same strong security.

There are a handful of proposals of how to realize a Privacy-ABC system in the literature. Notable is especially the appearance of two technologies, IBM's Identity Mixer and Microsoft's U-Prove, as well as extended work done in past EU projects. In particular, the EU-funded projects PRIME and PrimeLife have actually shown that the state-of-the art research prototypes of Privacy-ABC systems can indeed confront the privacy challenges of identity management systems.

The PRIME project has designed an architecture for privacy-enhancing identity management that combines anonymous credentials with attribute-based access control, and anonymous communication. That project has further demonstrated the practical feasibility with a prototypical implementation of that architecture and demonstrators for application areas such as e-learning and location-based services. PRIME has, however, also uncovered that in order for these concepts to be applicable in practice further research is needed in the areas of user interfaces, policy languages, and infrastructures.

The PrimeLife project has set out in 2008 to take up these challenges and made successful steps towards solutions in these areas. For instance, it has shown that Privacy-ABC systems can be employed on Smart Cards and thus address the requirements of privacy-protecting eID cards. Also, in the last decade, a large number of research papers have been published solve probably all roadblocks to employ Privacy-ABC technologies in practice. This includes means to revoke certificate, protection of credentials from malware [Cam06], protection against credential abuse, proving properties about certified attributes, and means to revoke anonymity in case of misuse.

Despite all of this, the effort of understanding Privacy-ABC technologies so far was rather theoretical and limited to individual research prototypes. Indeed, so far, PRIME and PrimeLife only showed that Privacy-ABC technologies provide privacy-protection in principle.

Furthermore, there are no commonly agreed set of functions, features, formats, protocols, and metrics to gauge and compare these Privacy-ABC technologies, and it is hard to judge the pros and cons of the different technologies to understand which ones are best suited to which scenarios.

Thus, there is still a gap between the technical cryptography and protocol sides of these technologies and the reality of deploying them in production environments. A related problem with these emerging technologies is the lack of standards to deploy them. As a result, ENISA observes that Privacy-ABC "technologies have been available for a long time, but there has not been much adoption in mainstream applications and eID card applications" even though countries such as Austria and Germany have taken some important steps in this sense.

1.4 The ABC4Trust Project

The aim of ABC4Trust is to deepen the understanding in Privacy-ABC technologies, enable their efficient/effective deployment in practice, and their federation in different domains. Towards this end, the ABC4Trust project aims to run the first ever pilots of Privacy-ABCs deployments in production environments. Thus, this will be the first time real user feedback on Privacy-ABC systems will be collected. ABC4Trust will gather practical experience with Privacy-ABCs applications in two specific environments.

To this end, the project:

1. Produces an architectural framework for Privacy-ABC technologies that allows different realizations of these technologies to coexist, be interchanged, and federated

    a. Identify and describe the different functional components of Privacy-ABC technologies, e.g. for request and issue of credentials and for claims proof;

    b. Produce a specification of data formats, interfaces, and protocols formats for this framework;

2. Defines criteria to compare the properties of realizations of these components in different technologies; and

3. Provides reference implementations of each of these components.

With a comparative understanding of today's available Privacy-ABC technologies, it will be easier for different user communities to decide which technology best serves them in which application scenario. It will also be easier to migrate to newer Privacy-ABC technologies that will undoubtedly appear over time. In addition the same users may want to access applications requiring different Privacy-ABC technologies, and the same applications may want to cater to user communities preferring different Privacy-ABC technologies.

Hence, it is also necessary that different Privacy-ABC technologies be able to coexist or be interchanged across scenarios involving the same users and application platforms. It may also be sometimes desirable to convert Privacy-ABCs from one technology into another so as to federate them across different domains, as is done today between different authentication domains using standards such as SAML, WS-Trust, Kerberos, OpenID, or OAuth. There are no commonly agreed sets of functions, features, formats, protocols, and metrics to gauge and compare Privacy-ABC technologies, so it is hard to judge their respective pros and cons. There is also currently no established practice or standard to allow for the interchangeability and federation of Privacy-ABC technologies.

A number of countries have already introduced or are about to introduce electronic identity cards (eID) and drivers licenses. Electronic ticketing and toll systems are also widely used all over the world. As such electronic devices become widespread for identification, authentication, and payment (which links them to people through credit card systems) in a broad range of scenarios, the users' privacy and traceability will be increasingly threatened in the future internet society. If and when eIDs are rolled out, society and countries are well advised to build privacy protection techniques into them.

2 University Pilot Description

2.1 Before the Semester

The students that will participate in the evaluation will be briefed on the scope and the goal of the pilot. Before the actual trial, CTI will select 3 to 5 student-volunteers in order to participate to an on-site testing of Course Rating by certified students. For the main trial a group of 60 students will take part in the evaluation of the "Distributed Systems I" course that they have attended at a University Department.

2.2 During the Semester

Students of Computer Engineering and Informatics Department will be issued credentials that certify a number of facts about them:

1. They are eligible students of the at the Computer Engineering and Informatics Department University
2. They have picked a course.
3. They have evaluated the course and they can join the lottery.

The student credentials will be stored in smart cards and will be used to generate presentation tokens which are transmitted to the relying party's information system over the Internet. All the participated students have been issued Privacy-ABCs that certify students' information (first name, last name, etc.) and information related with the course. Student can log on to IdM portal and can view and administrate some of your own data using these credentials.

Moreover each student can collect his attendance information by waving his smart cart in front of a contactless NFC reader when leaving the lecturing room. Student's smart-card is updated every time he attends a class. Each student can back up his attendance information and to restore backed up data on his (new) smart card at any time he wants. All the students that will take part in the evaluation of the course have to prove their attendance for a sufficient number of lectures without, however, revealing the exact attendance ratio and which lectures you visited. This scenario uses the Class Attendance system presented in pilot's architecture in order to collect students' attendance information.

2.3 At the End of Semester

The first round of ABC4Trust Pilot was performed on the fall semester of the year 2012. The second round of ABC4Trust Pilot will performed on the fall semester of the year 2013, to evaluate a course whose examination will be performed in February 2014. This assures that the second trial will take advantage of the experience from the first as well as a new version of the reference implementation with corrections proposed during the first trial.

This Course Evaluation scenario is used for the realization of the course evaluation. Before the end of semester the HQAA will cooperate with the Department in order to distribute a general template of course evaluation questionnaire to professors. The professor has to customize the course evaluation questionnaire to suit the course's needs. After this, the professor submits the course questionnaire using the course evaluation application. After the final exam has taken place, the students will be able to evaluate the course at any time from their home.

The participated students will be able to anonymously rate courses that they took while ensuring that 1) students are indeed students of the department of 2) they have taken the course and have had sufficient attendance (i.e. attribute based credentials will be employed to prove these facts) and 3) can only rate the course once, without keeping list of students who have already rated the courses, so as to protect student anonymity. Moreover, the students will be able to anonymously join the Tombola lottery while ensuring that they have submitted their course questionnaire. When the lottery ends, the winner will be announced and he will receive his prize.

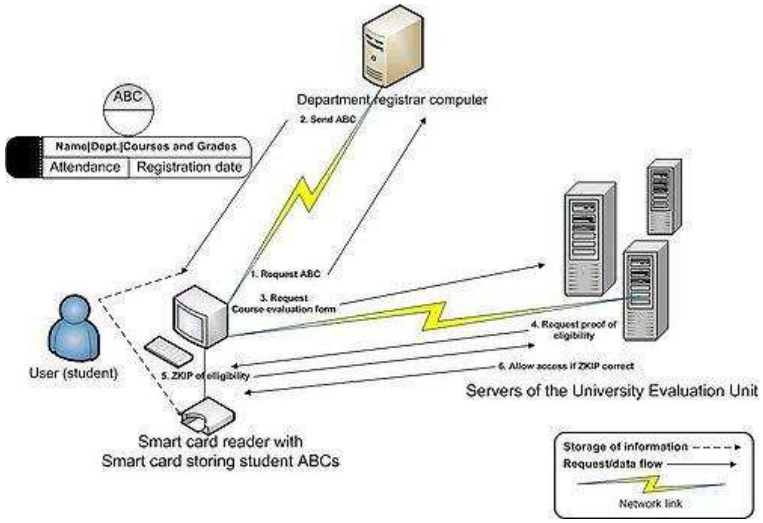

Figure 2: University Pilot Overview

2.4 University Pilot Portal

University Pilot Portal is an information web portal (see Figure 3). Through this portal, all the students can be informed about the system's functionality and can be instructed on how to operate it. Thus, this page provides to the users the necessary links to the components of the system (e.g. University Registration System, Course Evaluation System) that are responsible for specific functionalities. Every time a user desires to interact with the system, his first action is to visit this portal and by following the instructions he can perform various pilot operations (e.g. register to a course, evaluate a course).

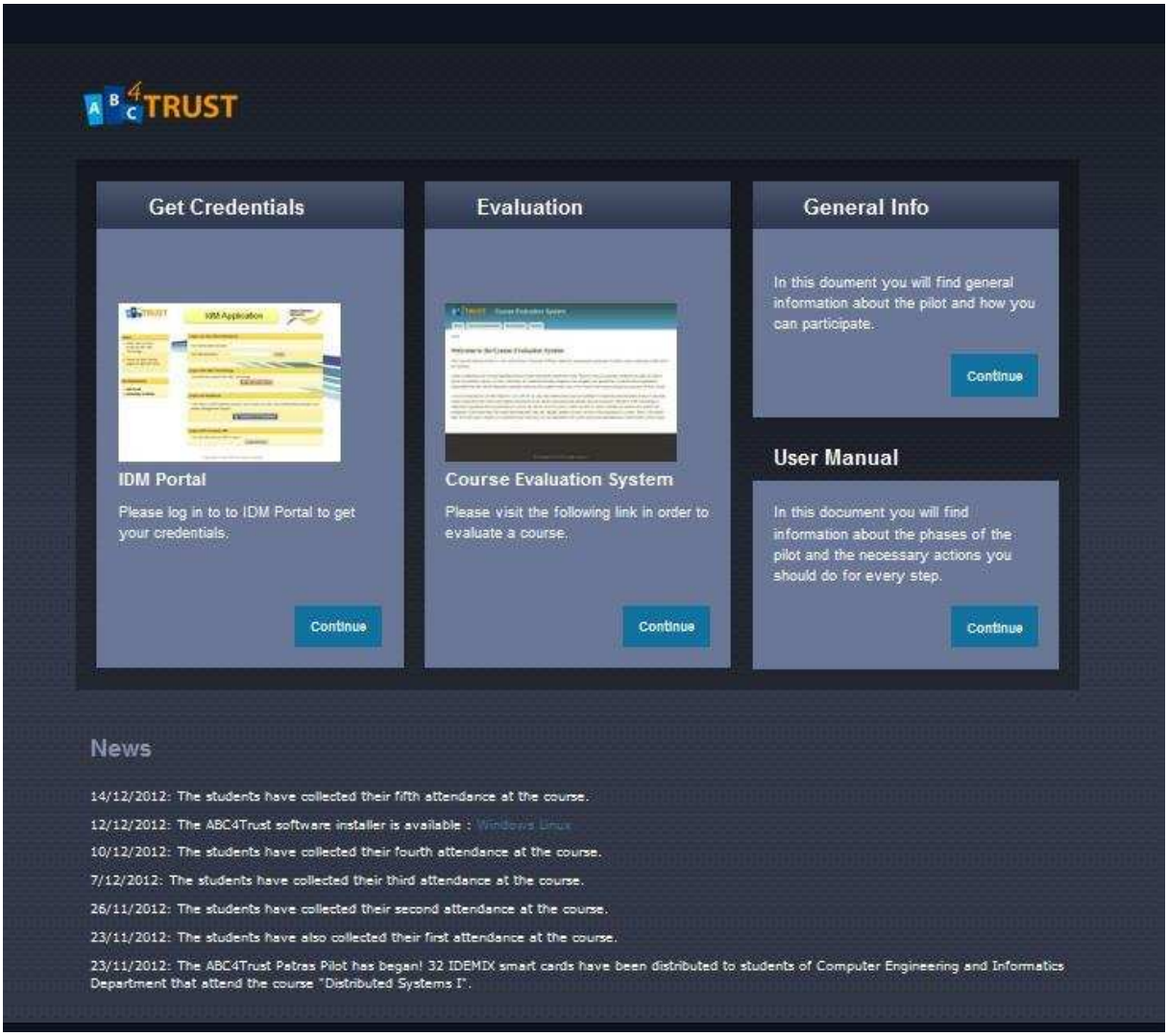

Figure 3: University Pilot's Portal

As the Figure 3 shows it consists of four blocks: Get Credentials, Evaluation, General Information and User Manual. Get Credentials and Evaluation blocks describe the University Registration System and Course Evaluation System respectively and with the button Continue the student visits their site. In the General Information block you can find a presentation introducing the concepts of Privacy-ABCs and the goals of the pilot and in the User Manual clock you can see the User Guide.

Finally, the Patras Portal contains all the necessary software for the evaluation process.

√ To Access Patras Portal Follow the link: https://ces.cti.gr/Portal/Portal.html

3 Participating in the Pilot

Welcome to the ABC4Trust pilot!

In this section we provide a step-by-step description of the actions you need to take in order to successfully participate in ABC4Trust pilot. A quick overview of all the activities is shown in Figure 4. As you see we have three phases (Red, Blue and Green) for a semester and each one requires you to follow certain steps in order to enable the next phase.

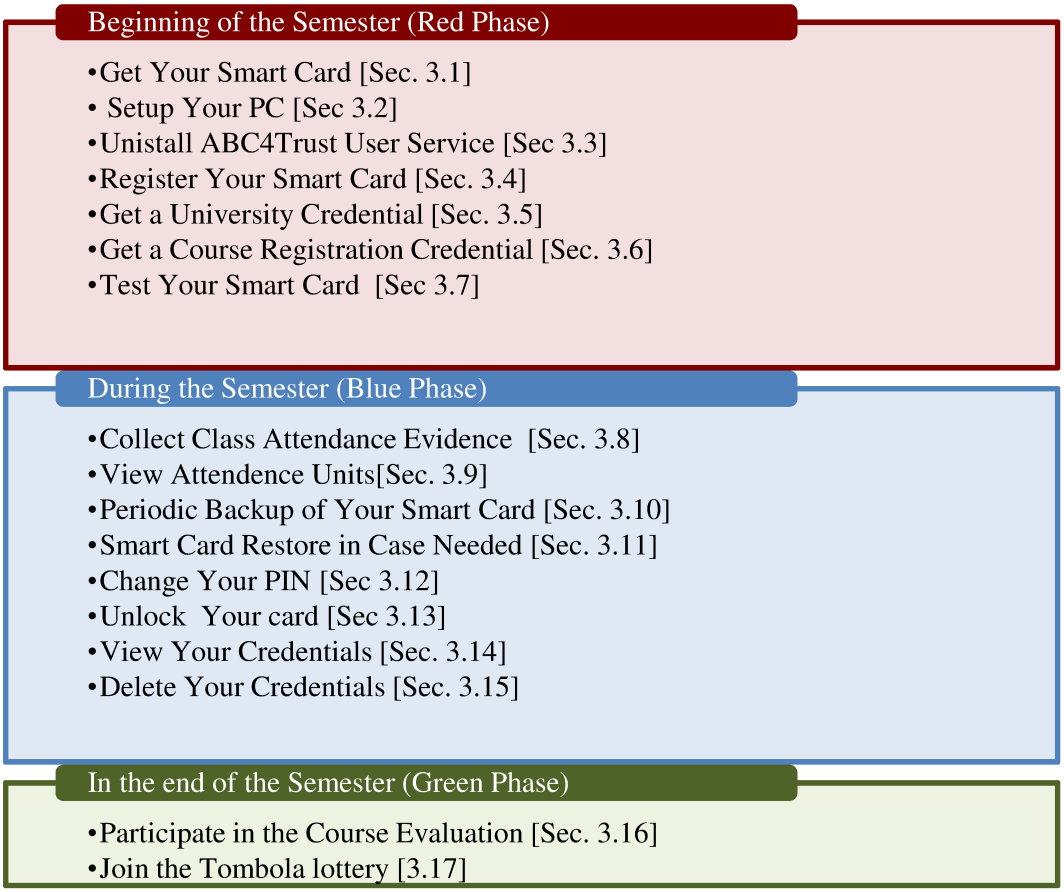

Figure 4: A Quick Overview of pilot

As a summary of the whole process, you will receive a smart card package that enables you to interact with the system. After the necessary initializations that are described in the following sections you need to download certified credentials that can help you prove your registration in the university and enrollment in the course. At this point the Red Phase is over and you can begin with the Blue Phase. You need to use your smart card to collect the attendance data for each lecture of the pilot course that you participate. These evidences are necessary to prove that you are eligible for evaluating the course. Since your smart card is the only place that this information is stored, you must periodically make backups of the card data so that in case of loss or defeat, you can restore them into a new card. When you reach the end of the semester, the Green phase will start and you can follow the given steps to express your opinion about the course anonymously and to join the Tombola lottery.

3.1 How to get your Smart Card

The department's Registration Office will provide you your smart card package after you signed the necessary documents and gave your consent to participate in the pilot. In particular, this package contains the following items:

- ☑ A smart card (see Figure 5)
- ☑ A smart card reader (see Figure 6)
- ☑ A sealed envelope that is marked with the smart card ID and contains your smart card's PIN and PUK. (see Figure 7)
- ☑ A slip of paper containing a one-time-password (OTP, see Figure 8)

When you receive this package, the University Registration office records your name, envelope's identification number (=smart card IDs) and the corresponding OTP.

Figure 5: A smart card

Figure 6: A smart card reader

DeviceID 35 pin 4220 puk 48520787

Figure 7: PIN and PUK

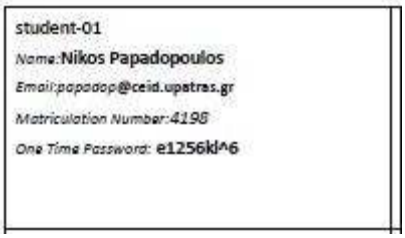

Figure 8: The slip of paper containing a one-time-password

3.2 How to Setup Your PC

This phase describes the necessary steps you should follow in order to setup your PC.

Note:

- **You must have in your possession a smart card with a user secret, a PIN and a PUK.**
- **You must have also a smart card reader.**

How to Setup Your PC - Step 1:

Plug the USB cable of card Reader to your computer as the Figure 9 shows. Otherwise, you can use the University's card readers, which are located in the computer center.

Figure 9: Smart card reader

How to Setup Your PC - Step 2:

Let windows update manager to install the necessary drivers in order to identify the smart card reader. You will see the following system's notification message on your screen.

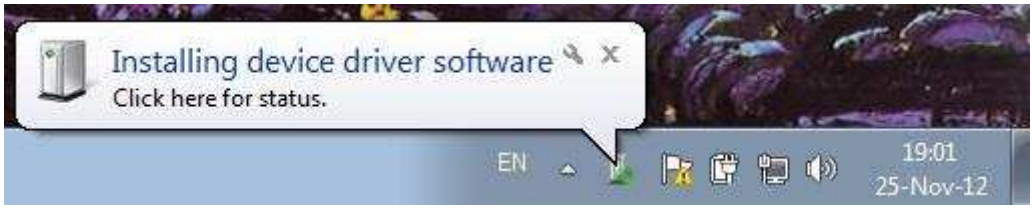

Figure 10: Installing SC reader's driver software

How to Setup Your PC - Step 3:

Visit Patras Portal site at https://ces.cti.gr/Portal/Portal.html. You will see the following interface on your screen. Please download the "ABC4Trust User Service setup Wizard" and save it to your PC.

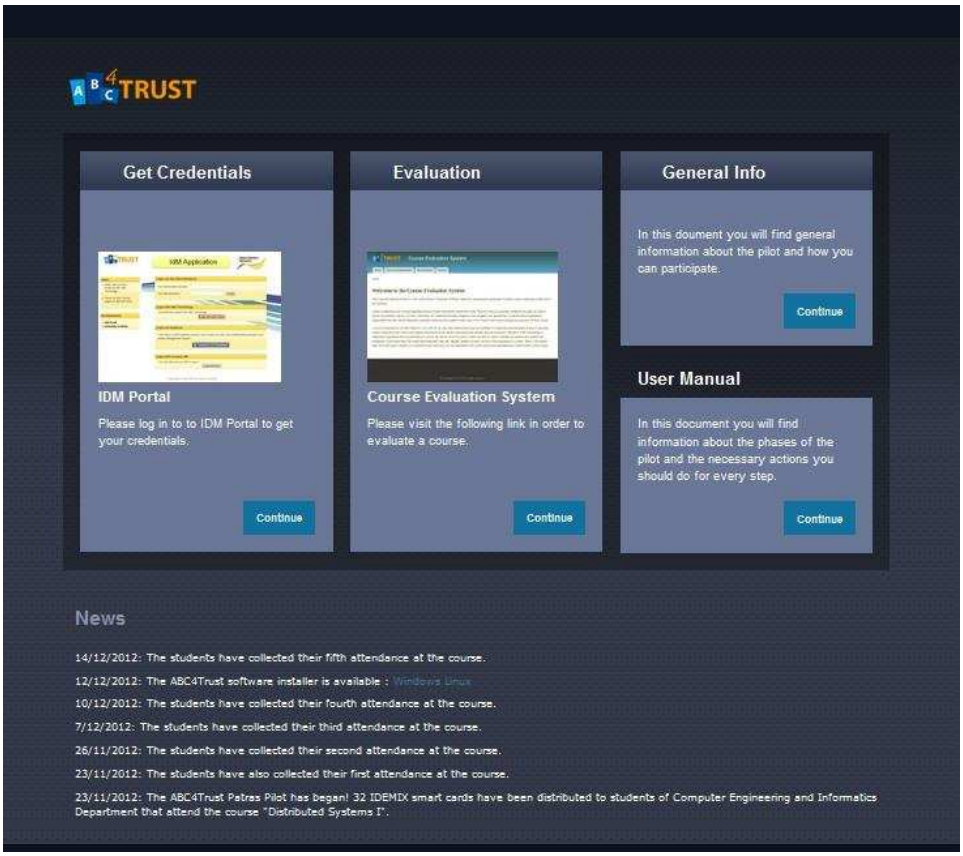

Figure 11: Patras Portal

How to Setup Your PC – Step4:

Now open the downloaded install.exe file and execute it. Please click on the install link as Figure 12 shows. After completing the installation select the finish button as Figure 13 shows.

Step1: Select the language

Figure 12: ABC4Trust User Service Setup Wizard

Figure 13: Finishing the Instalation

How to Setup Your PC – Step 5:

At this point you have installed the ABC4Trust User Service application, which is consisted of:

- √ A plugin for your Firefox browser (see Figure 14)
- √ A local ABC4Trust Web Service (see Figure 17)

How to Setup Your PC – Step 6:

Now if you want to verify that the Firefox Plugin installation has been successful:

1. Restart your Firefox browser and you have to see the following interface (see Figure 14).
2. Then please select the corresponding tab as shown in order to accept ABC4Trust User service's installation.
3. Now, continue the installation and restart your browser (see Figure 15)

Figure 14: Firefox Plug in Installation

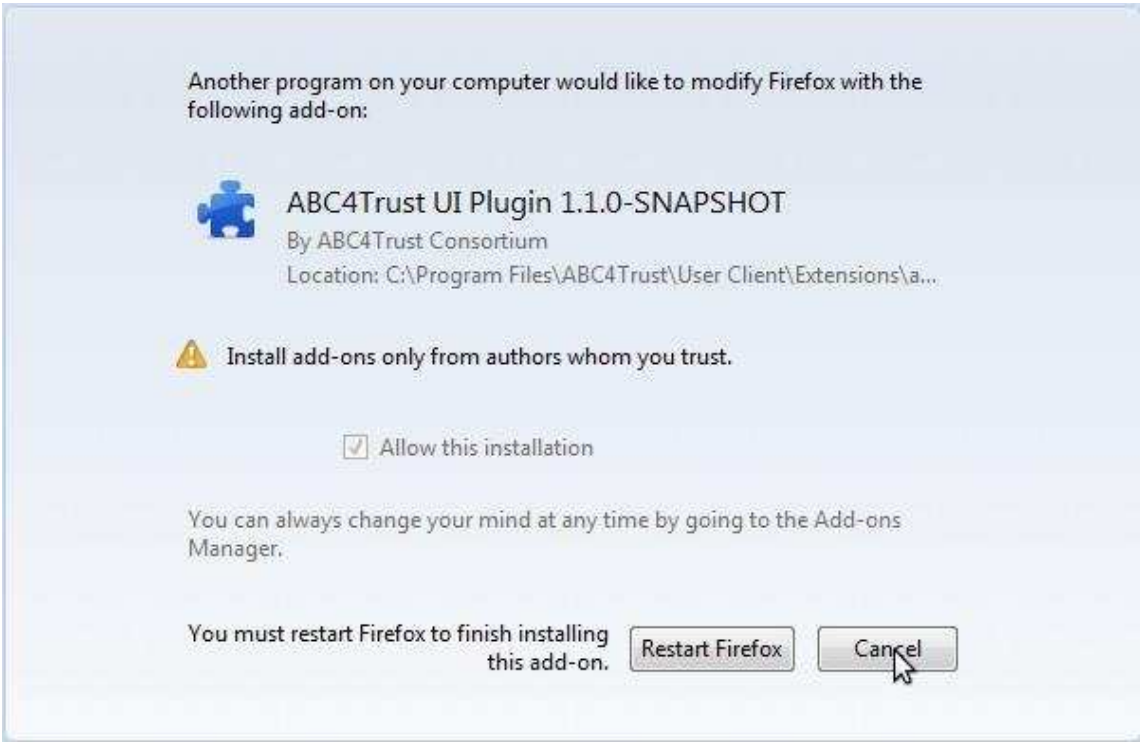

Figure 15: Restart Firefox

How to Setup Your PC – Step 7:

Finally, if you want to verify that the Local ABC4Trust User Service installation has been successful:

1. Run task manager application from windows-display menu (see Figure 16)
2. Now you must see that the ABC4Trust User Service is running at the services menu, as Figure 17 shows.

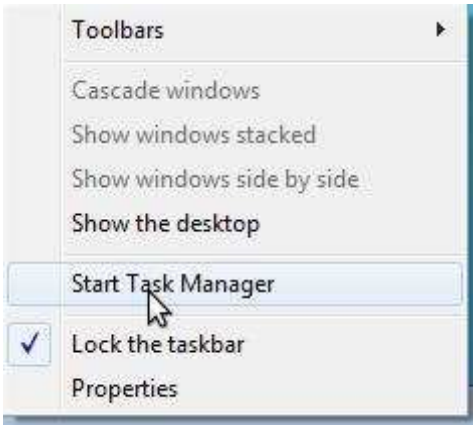

Figure 16: Run Task Manager Application

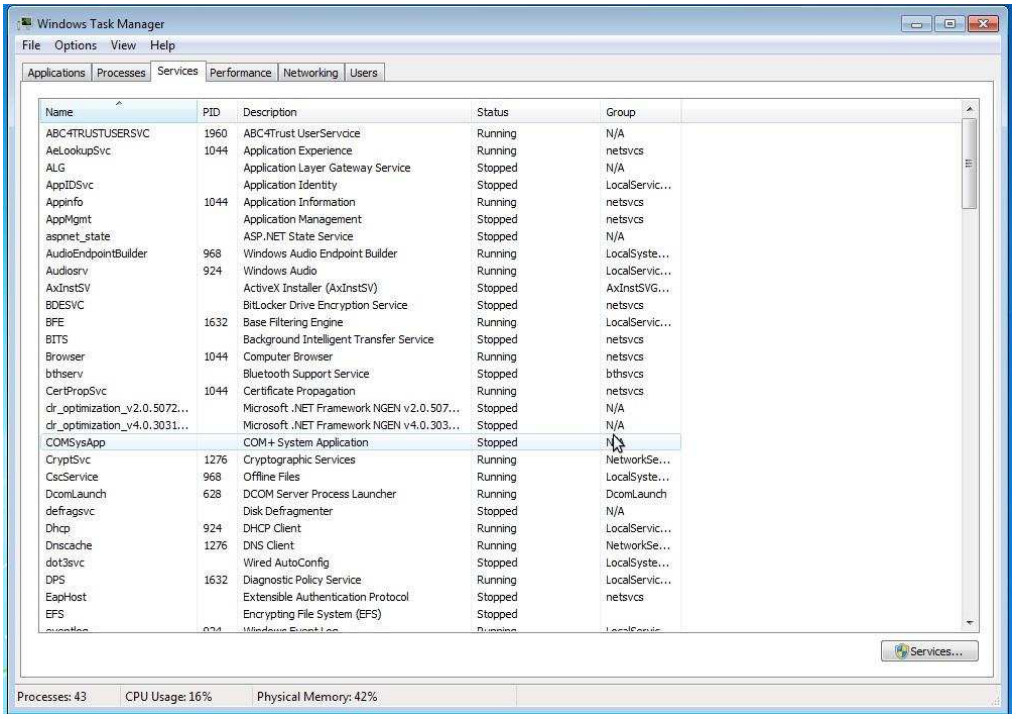

Figure 17: ABC4Trust User Service Running

Troubleshooting Setup procedure

- ✓ If you cannot see the windows update manager notification figure (as Figure 10 shows), you have to restart your PC with your smart card connected to your computer via your reader as the Figure 9 shows.
- ✓ If you cannot install the smart card reader properly (step 2), you can download the driver from the manufacture home page (see Figure 18) and install it
- ✓ If you cannot see the plugin at your Firefox browser, as Figure 14, shows please restart your browser. If the plugin notification is still missing, you have to repeat the setup procedure from the beginning.
- ✓ If the ABC4Trust User Service is running at the services menu, as Figure 17 shows:

1. Please restart your PC and repeat the above step 7.
2. If the ABC4Trust User Service is not running, you have to uninstall the ABC4Trust User Service (see Section 3.3) and repeat the setup procedure from the beginning.

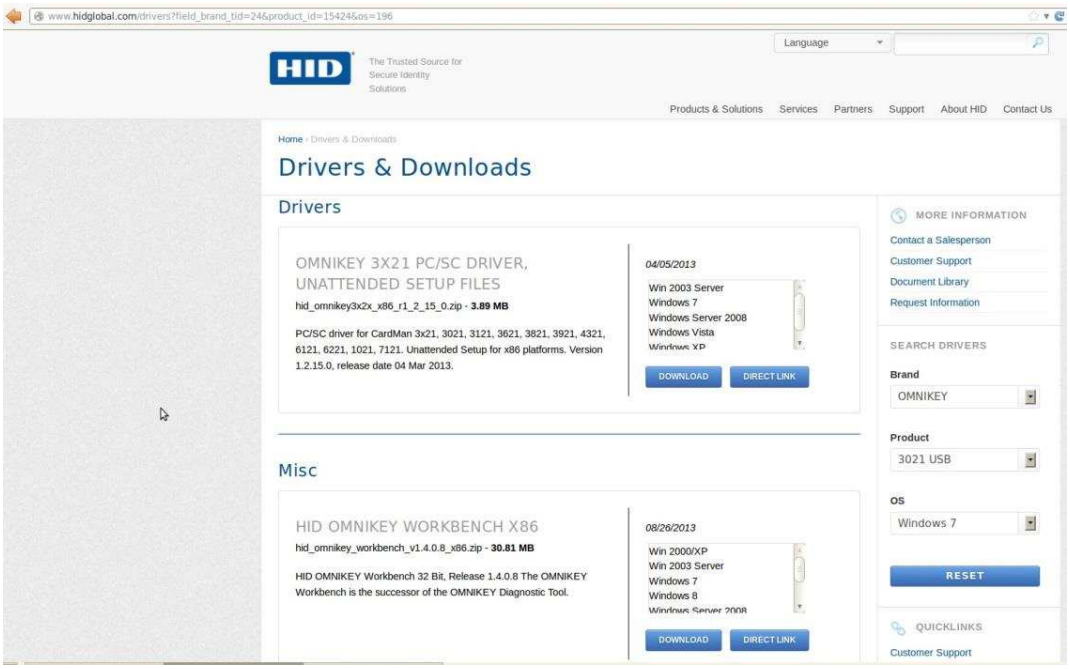

Figure 18: Download Smart Card Reader's Driver

3.3 How to Uninstall ABC4Trust User Service

This phase describes the necessary steps you should follow in order to uninstall the ABC4Trust User Service.

Note:

- **You must have installed the ABC4Trust service at your computer.**

How to Uninstall ABC4Trust User Service - Step 1:

Open the Folder of User Client under the path C:/Program Files/ABC4Trust/User Client. Please run the uninstall.exe that is located in the User Client folder as shown in the following figure.

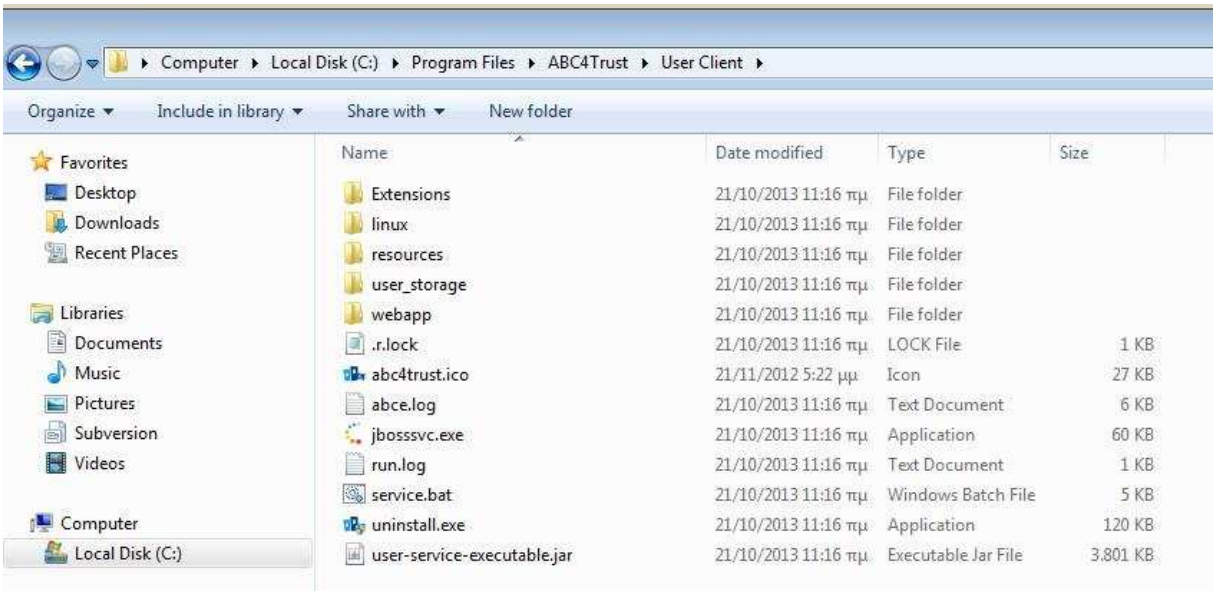

Figure 19: User Client Folder

How to Uninstall ABC4Trust User Service - Step 2:

Now the ABC4Trust User Client Uninstall application pops up. Please click on the Uninstall link as Figure 20 shows.

Figure 20: Uninstall the ABC4Trust User Client

Uninstall ABC4Trust User Service - Step 3:

Now click the finish button in order to complete the uninstall process as Figure 21shows.

Figure 21: Completing Uninstall Process

Troubleshooting Uninstall procedure

✓ If you cannot see the User Client under the path C:/Program Files/ABC4Trust/User Client (as Figure 19 shows), you have not installed the User Client on your PC.

3.4 How to Register Your Smart Card

This phase describes the procedures required so that the students can register their smart cards.

Note:

- **You must have in your possession a smart card with a user secret, a PIN and a PUK.**
- **You must have also a smart card reader.**
- **You must have installed the ABC4Trust service at your computer.**

How to Register Your Smart Card - Step 1:

Plug the USB cable of card Reader to your computer and place the smart card into the card Reader as the Figure 22 shows. Otherwise, you can use the University's card readers, which are located in the computer center.

Figure 22: Smart card reader

How to Register Your Smart Card - Step 2:

Visit Patras Portal site at https://ces.cti.gr/Portal/Portal.html. You will see the following interface on your screen. Follow the link for "Get Credential".

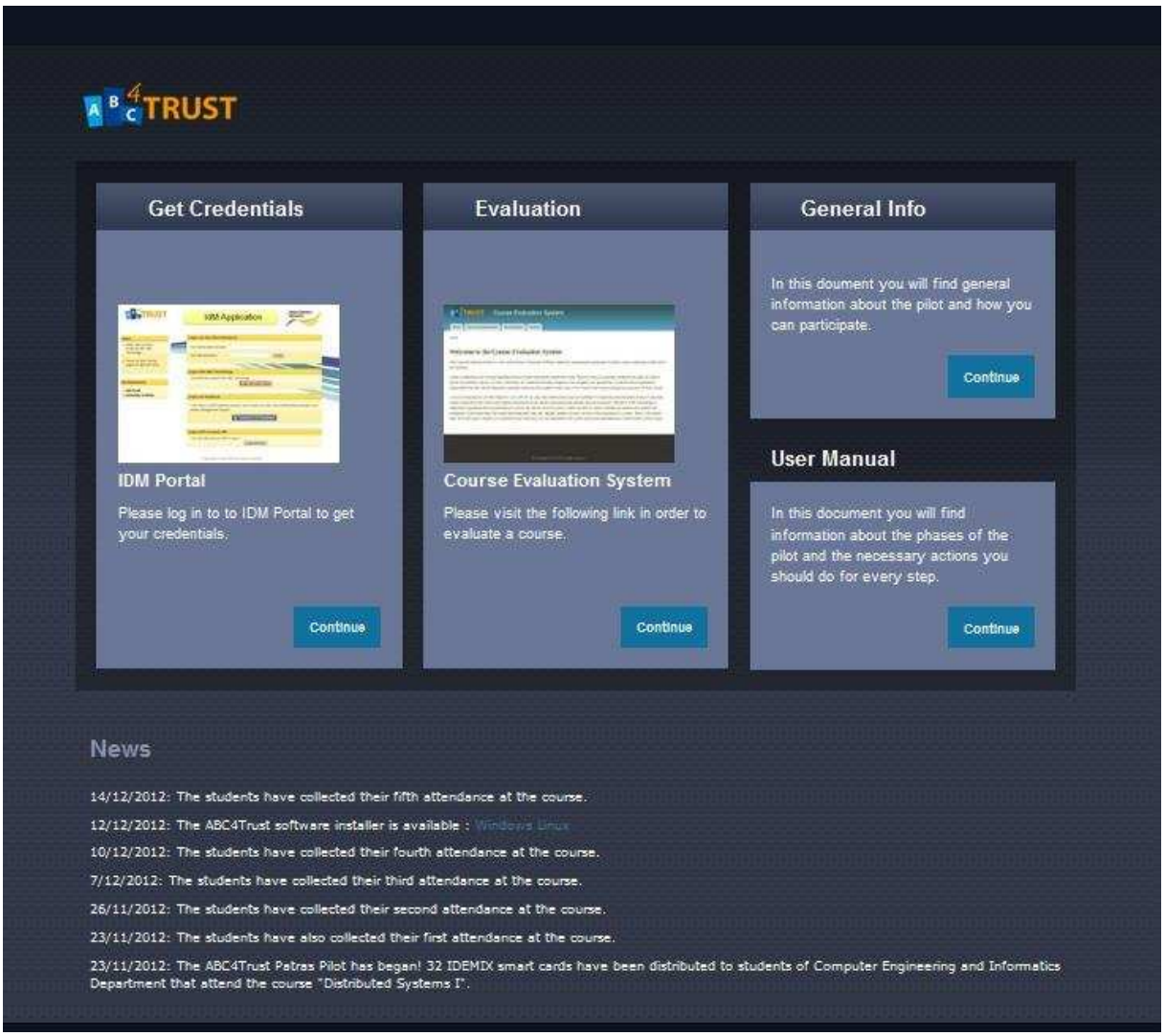

Figure 23: Patras Portal

How to Register Your Smart Card - Step 3:

Now you are redirected to IdM Portal. Now, you will see the following notification and follow the "I Understand the Risks" link.

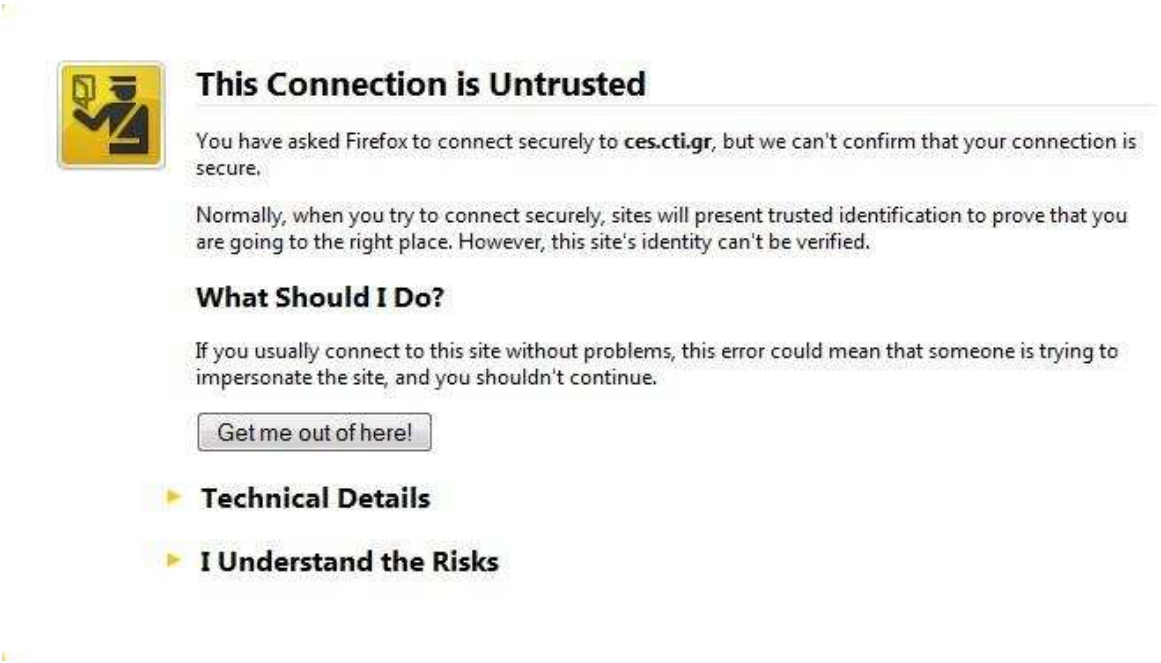

Figure 24: Add IdmPortal Security Exception

How to Register Your Smart Card - Step 4:

Now you can see the following interface and you must select the "Add Exception" tab at the bottom of the window as Figure 25 shows.

Figure 25: Add Security Exception for IdmPortal

How to Register Your Smart Card - Step 5:

Please click on the "Get Certificate" button and then click on the "Confirm Security Exception" button as seen on **Error! Reference source not found.**. The front page of he Idm Portal System will now appear.

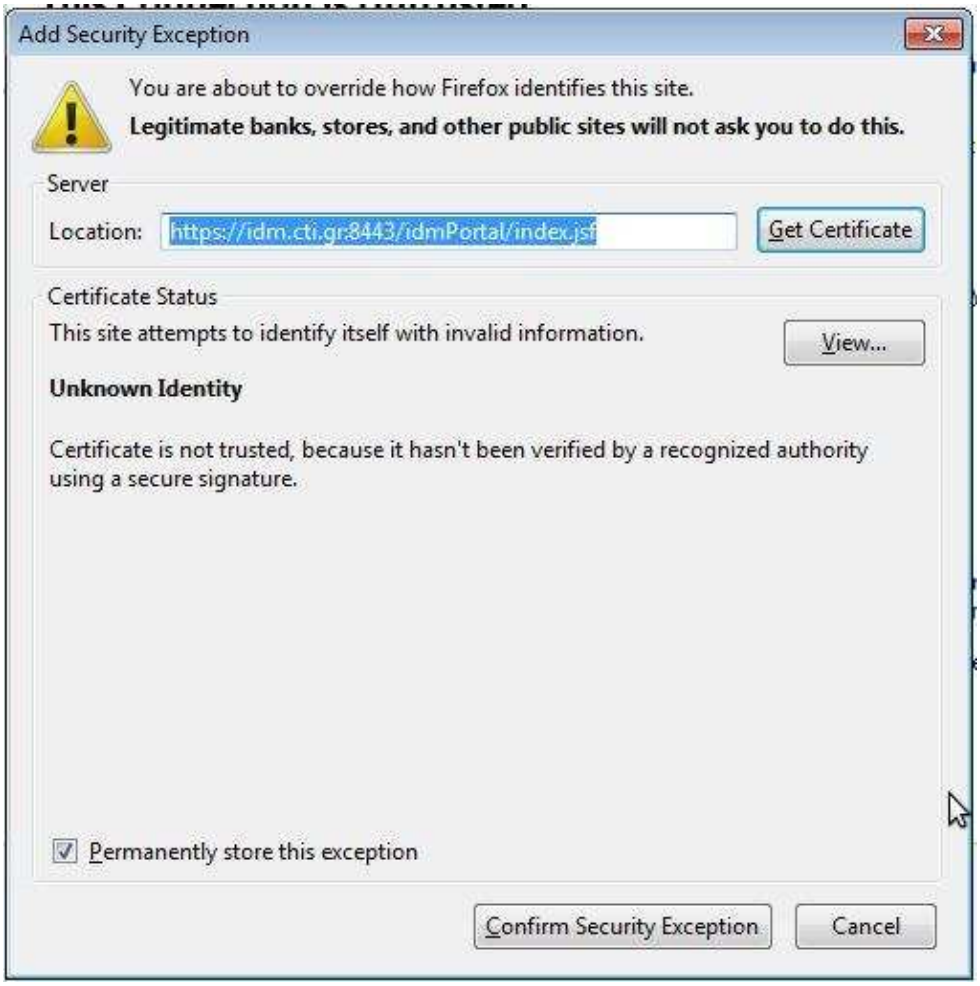

Figure 26: Confirm Security Exception for IdmPortal

How to Register Your Smart Card - Step 6:

Now you are redirected to IdM Portal welcome page as shown in the following Figure 27. Please click on the "Login" link on the left column of this page.

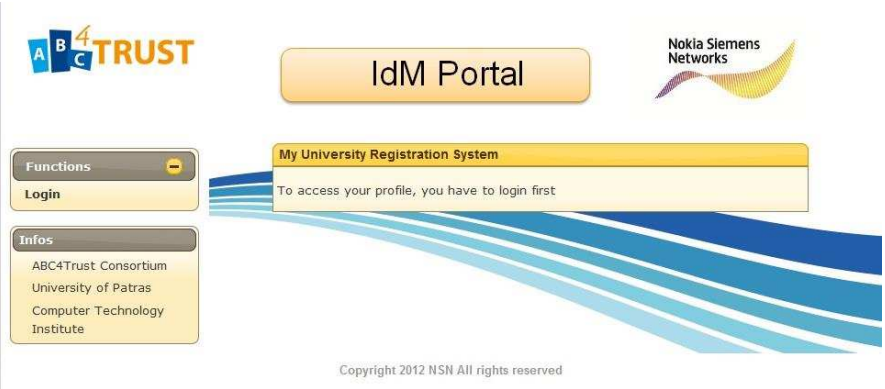

Figure 27: IdM Welcome Page

How to Register Your Smart Card – Step7:

At this point you need to login via your IdM Password. Enter your matriculation number and your password in the corresponding box as shown the Figure 28 below and click on the login button.

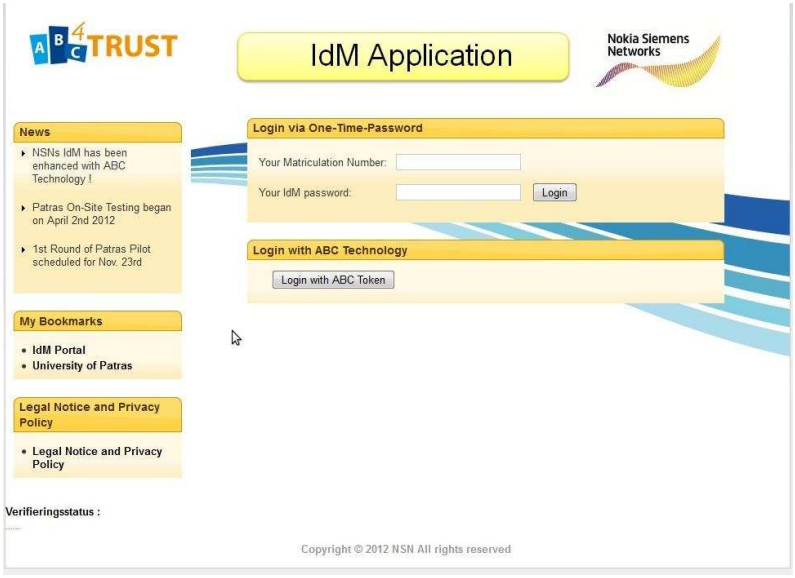

Figure 28: Login using Matriculation No and IdM password

How to Register Your Smart Card – Step 8:

If the authentication is successful you will see a welcome message (see Figure 29).

To continue with smart card registration click on "Register".

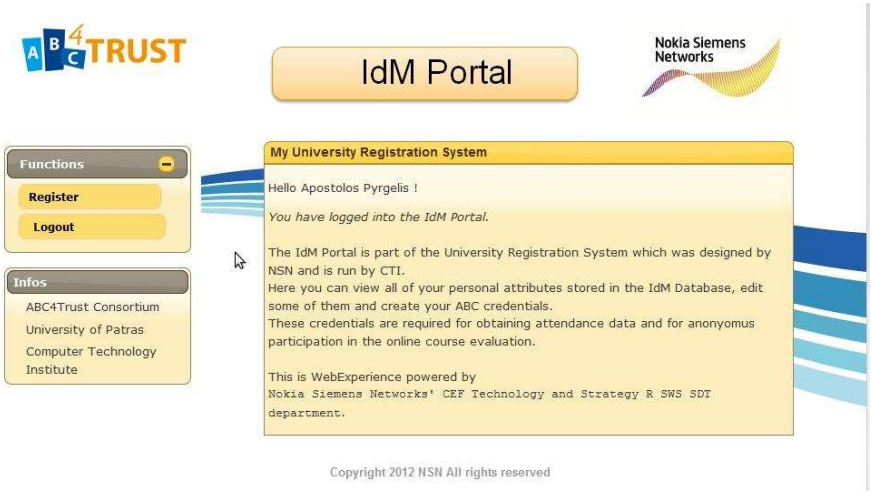

Figure 29: Login welcome message

How to Register Your Smart Card – Step 9:

At this point you should be seeing the page shown in the figure below. Please click on the link "Register your Smart Card".

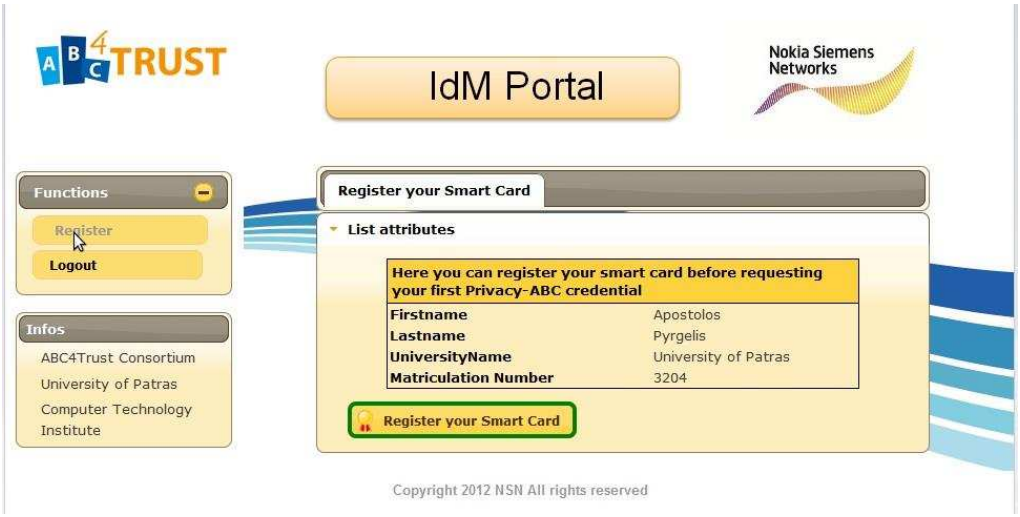

Figure 30: Smart card registration page

How to Register Your Smart Card – Step 10:

The ABC4Trust User Service application requests your PIN in order to unlock the card. Please enter your PIN in the corresponding box as following figure shows and click the "OK" button.

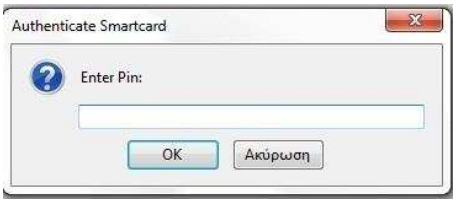

Figure 31: Smart Card Pin Authentication

How to Register Your Smart Card – Step 11:
Now the ABC4Trust Client application pops up and asks to select your policy for logging into the University Registration System. You have to select the following option:

☑ Pseudonyms: registration

Press Disclose to continue.

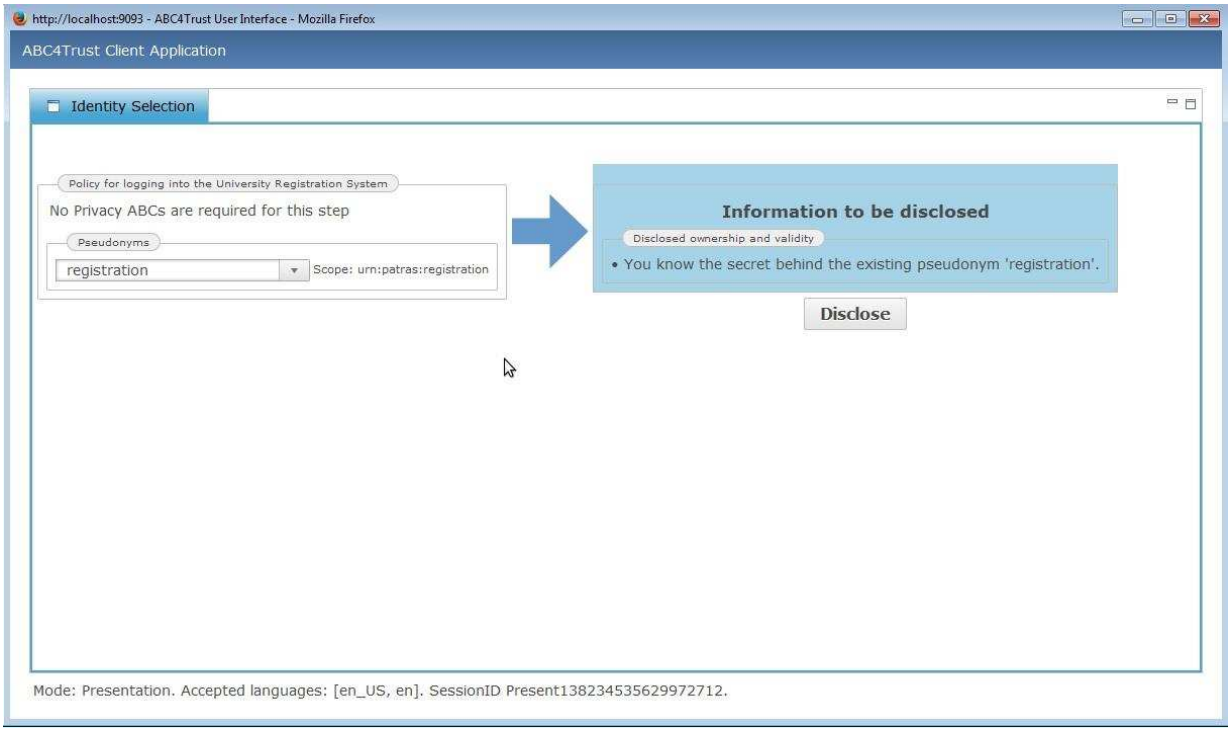

Figure 32: Identity Selection Window

How to Register Your Smart Card – Step 12:

The System authenticates you by using the stored data in your smart card and if your registration has completed successfully a message will be shown on top of the page (see Figure 33).

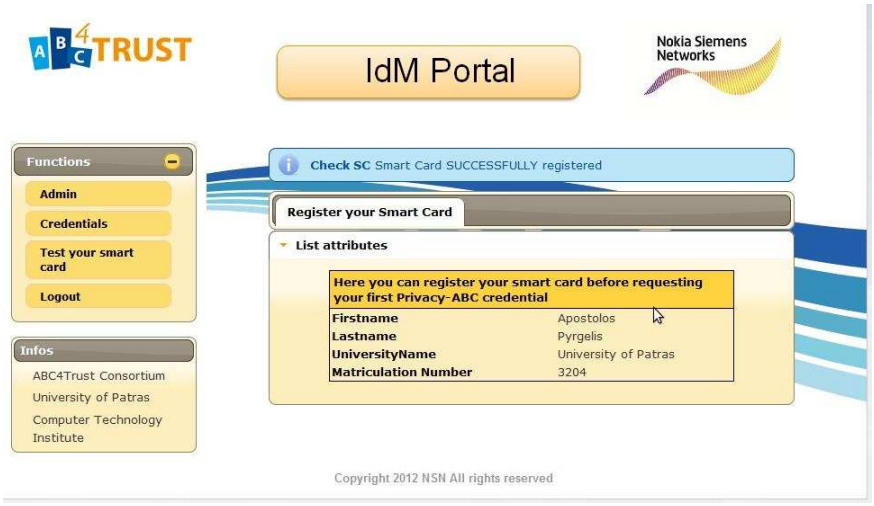

Figure 33: Successful smart card registration

How to Register Your Smart Card – Step 13:

Now you should be seeing the page shown in the Figure 34. If you are registered on the University department you can access your account information and all your attributes under the "Admin" menu (see Figure 35)

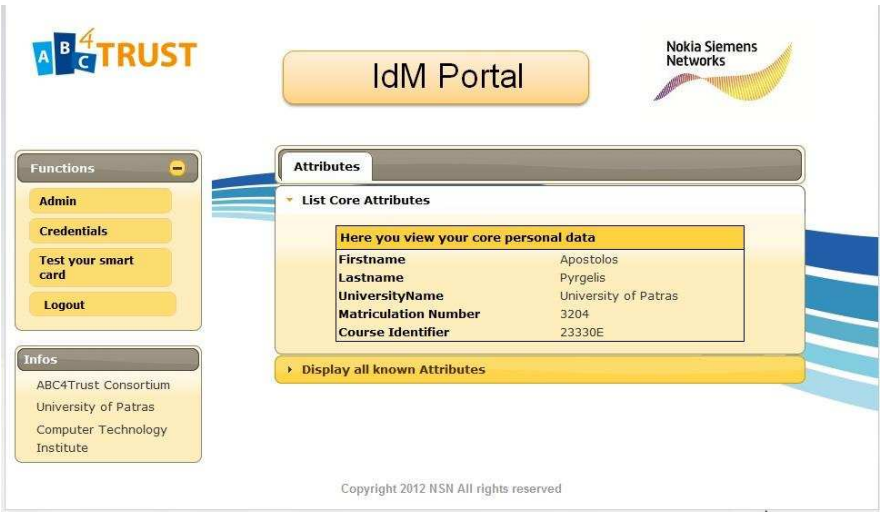

Figure 34: Student's account information

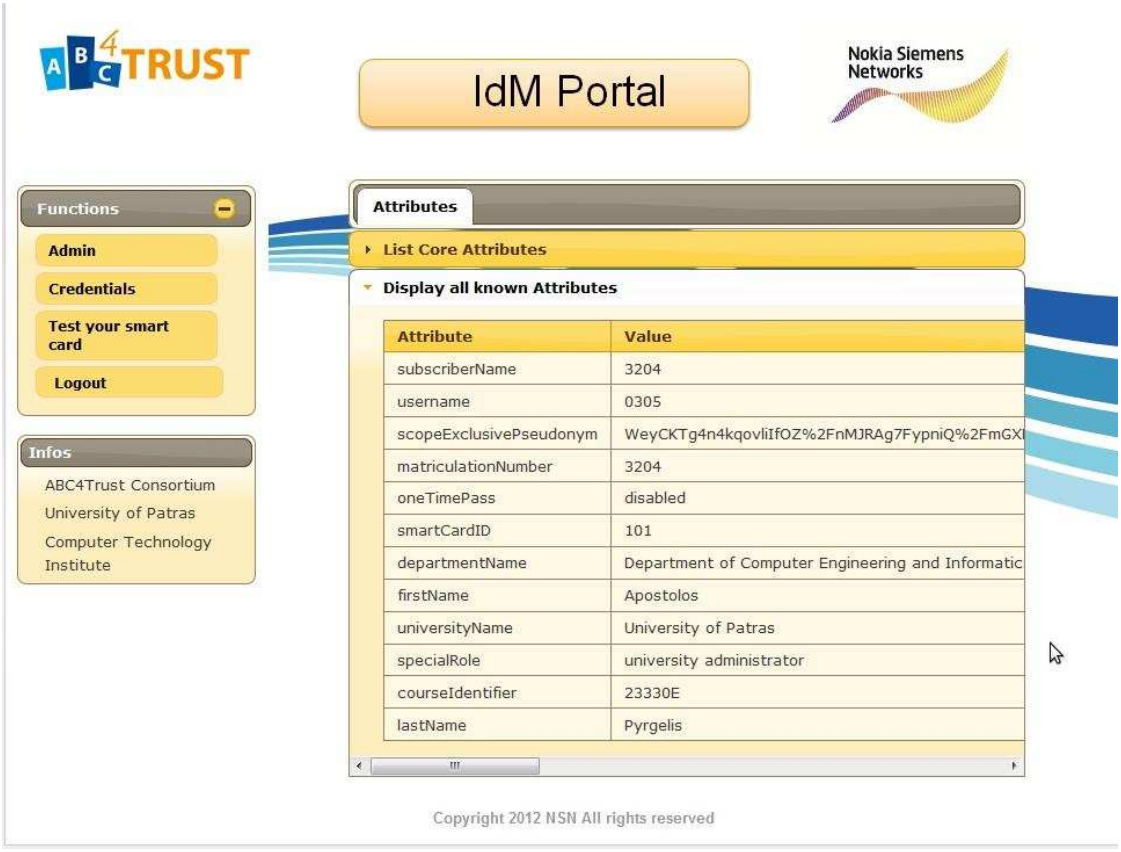

Figure 35: List of attributes

How to Register Your Smart Card - Step 14:

Now your smart card is registered and you can proceed with obtaining your credentials (see Section 3.5 and 3.6).

Troubleshooting the SC's Registration

- ✓ If you cannot access your account at step 5, you have to check and reenter your password and your matriculation number.
- ✓ If you cannot identify the selection menu at step 8, you have to check your smart card connection to your computer via your reader as the Figure 22 shows.
- ✓ If you cannot receive system's authentication at step 9 or get an error message, you have to check your smart card connection to your computer via your reader as the Figure 22 shows.
- ✓ If your status of your smart card does not appear as registered, you have to repeat the registration procedure from the beginning.

3.5 How to Obtain a University Credential

Note:

- **When you want to register at the University and obtain a valid student credential, you have to complete successfully the above registration phase (see Section 3.4) and possess a valid student Privacy-ABC on your smart card.**
- **You must have installed the ABC4Trust service at your computer.**
- **You have to plug the USB cable of card Reader to your computer and place the smart card into the card Reader.**

How to Obtain a University Credential - Step 1:

Visit Patras Portal site at https://ces.cti.gr/Portal/Portal.html. You will see the following interface on your screen. Follow the link for "Get Credential".

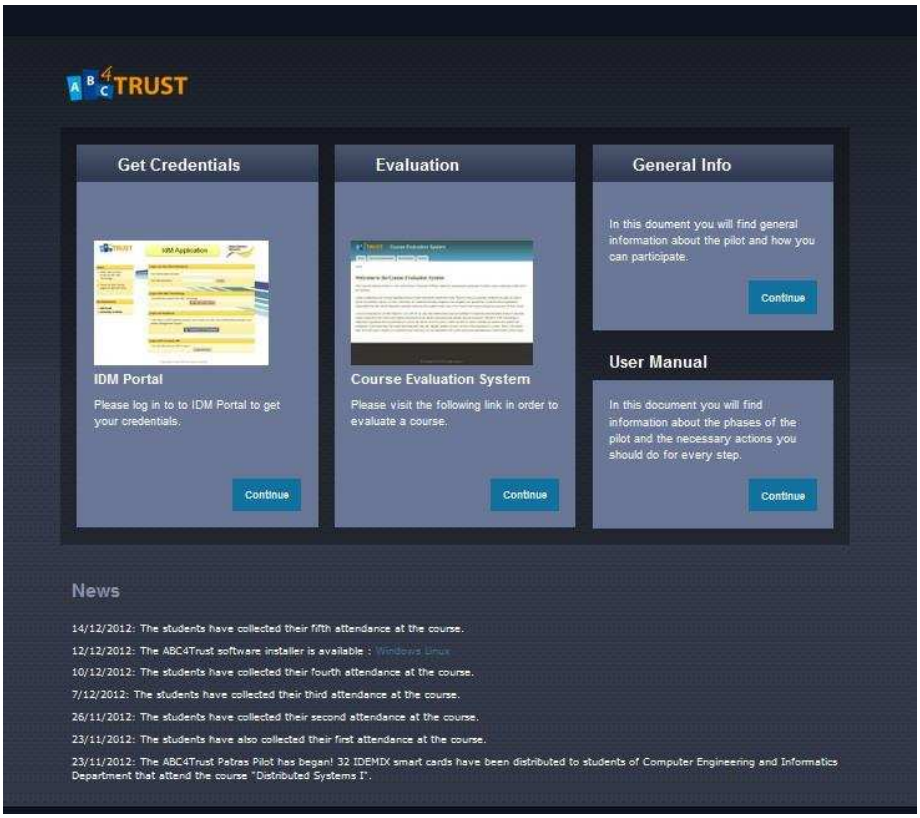

Figure 36: Patras Portal

How to Obtain a Course Credential - Step 2:

Now you are redirected to IdM Portal welcome page as shown in Figure 37. You need to login via ABC Technology. Select the 'log in with ABC token' tab as shown in Figure 37 in order to be logged in.

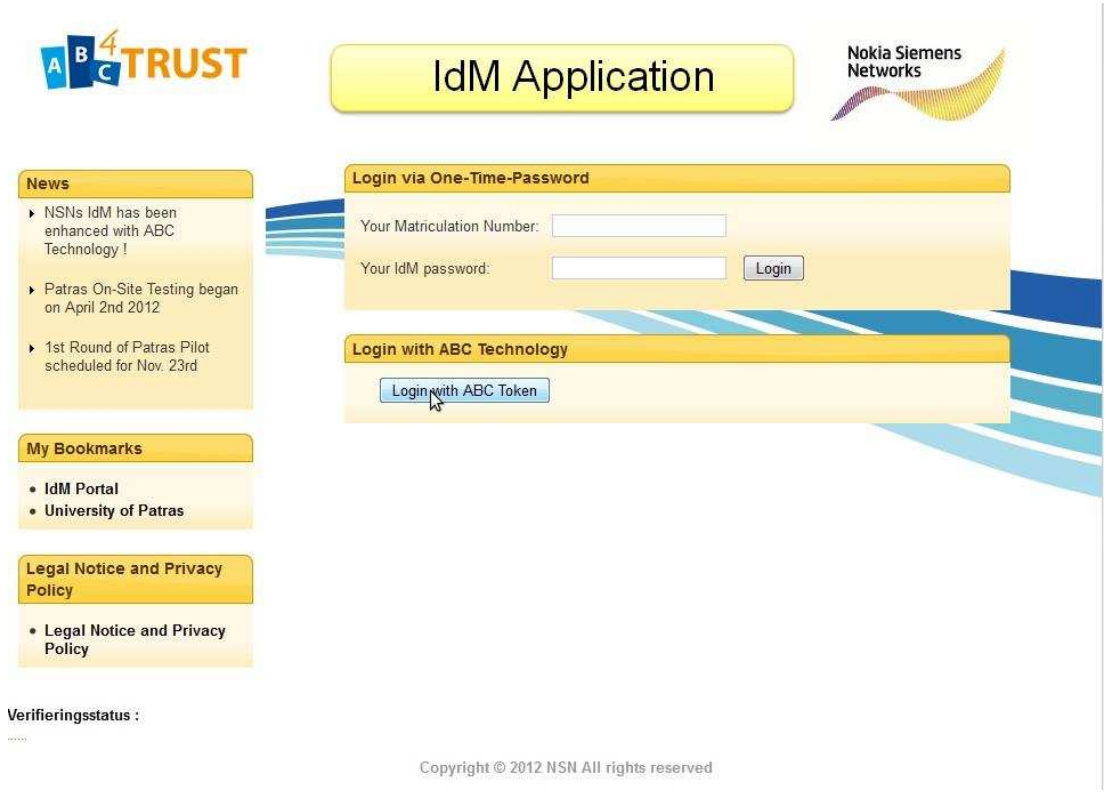

Figure 37: Log in with Privacy-ABC Token

How to Obtain a University Credential – Step 3:

The ABC4Trust User Service application requests your PIN in order to unlock the card. Please enter your PIN in the corresponding box as Figure 38 shows and click the "OK" button.

Figure 38: Smart Card PIN Authentication

How to Obtain a University Credential – Step 4:

Now the ABC4Trust Client application pops up and asks to select your policy for logging into the University Registration System. You have to select the following option:

☑ Pseudonyms: registration

Press Disclose to continue (see Figure 39).

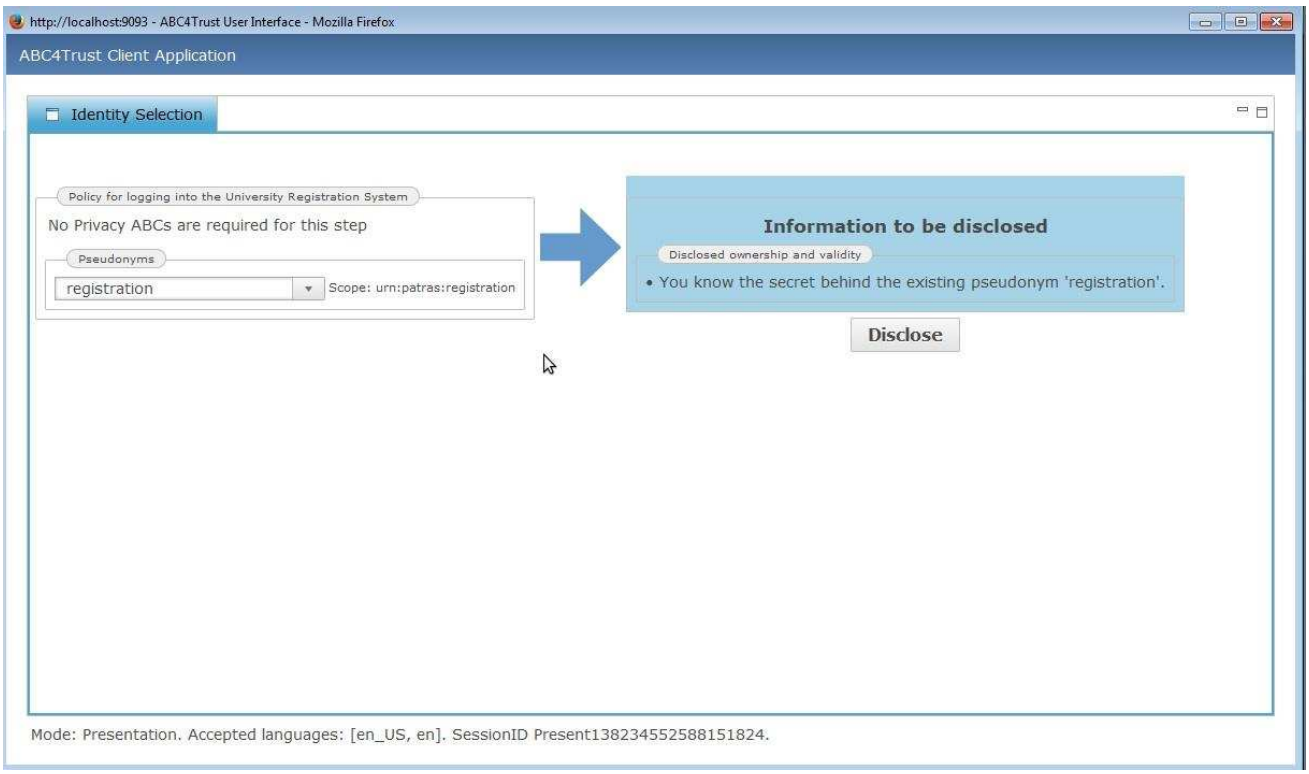

Figure 39: Identity Selection

How to Obtain a University Credential - Step 5:

If the authentication is successful you will see your account page as shown in Figure 40.

Now you can select "Credentials" link in the functions menu.

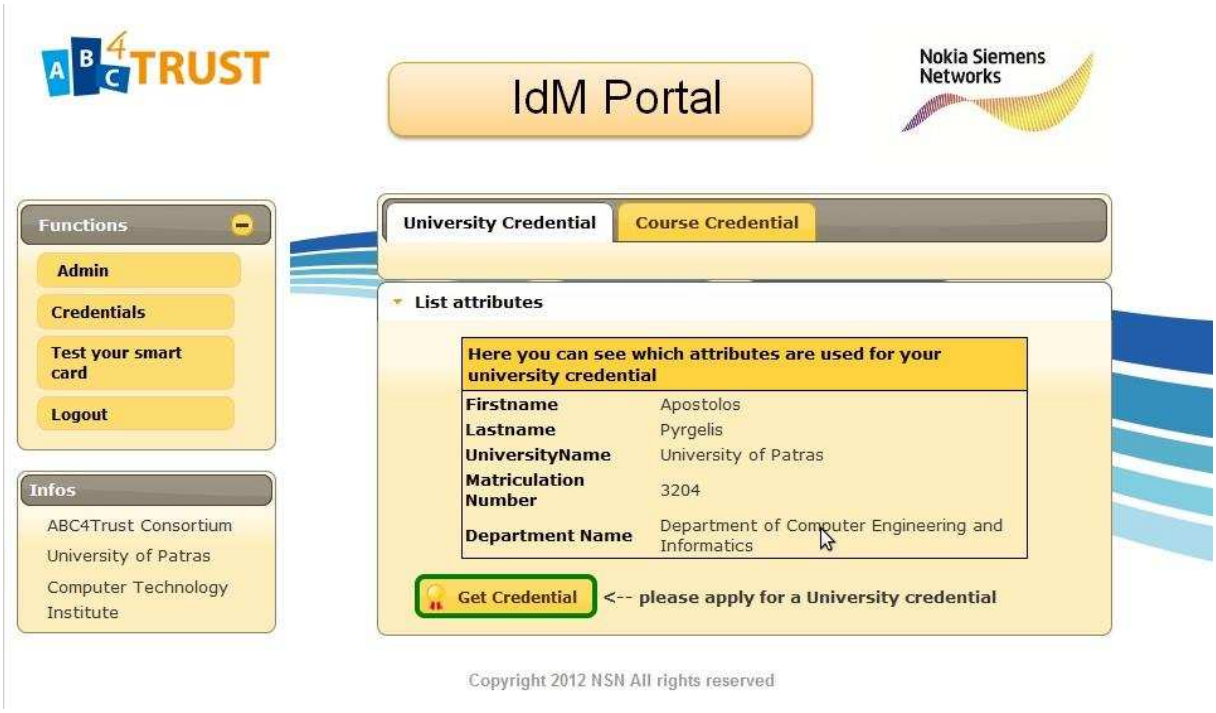

Figure 40: Credentials Environment

How to Obtain a University Credential – Step 6:

At this point your account page must be similar with the page shown in the Figure 40. Please click on the link "Get Credential" at the University Credential tab.

How to Obtain a University Credential – Step7:
Now the ABC4Trust Client application pops up and asks to select your policy for getting a University Credential. You have to select the following option:

- ☑ Pseudonyms: registration

You will be issued the following credential's properties:

- ☑ The credential is used by "urn:patras:issuer:credUniv:Idemix" and is of type University credential
- ☑ The credential is key-bound to the pseudonym 'registration'
- ☑ The credential is revocable

Press Disclose & obtain credential to continue (Figure 41).

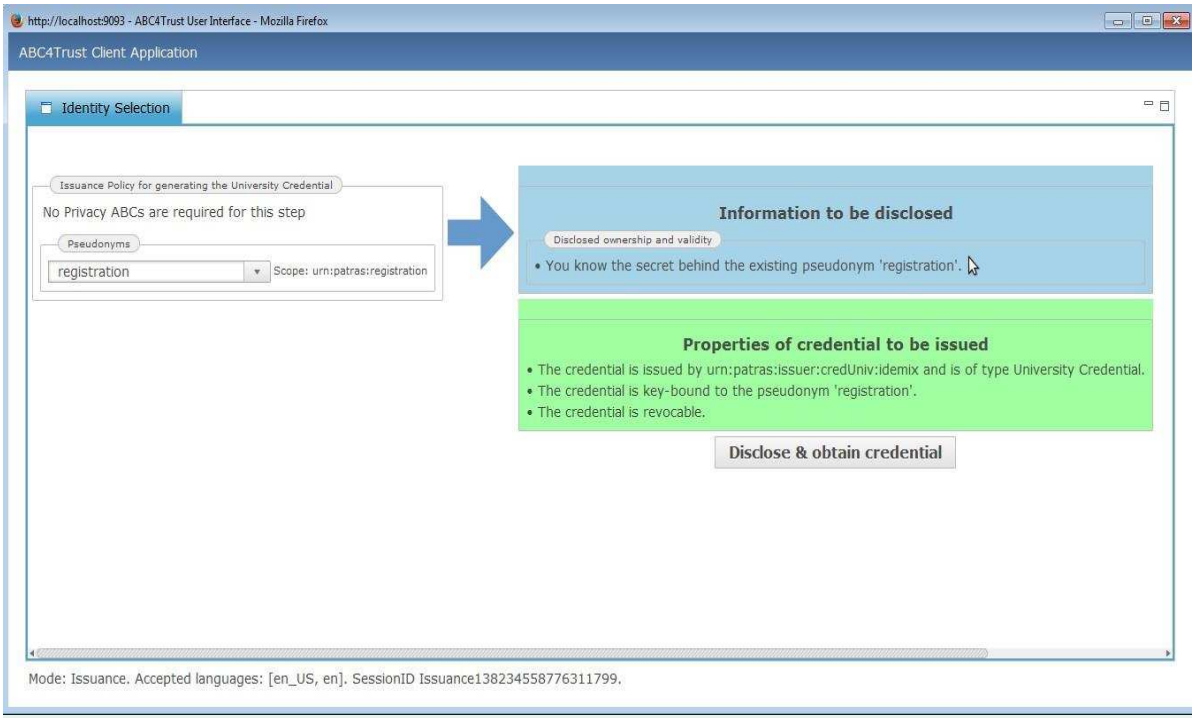

Figure 41: Credential Selection Window

How to Obtain a University Credential – Step 8:

The System authenticates you by using the stored data in your smart card. If your University credential is stored in your smart card your credential status will be appeared as shown in Figure 42. To verify that your credential was successfully stored on your card, you can test your Smart Card (see Section 3.7). Moreover you are able to view your University Credential stored on your card (see Section 3.14).

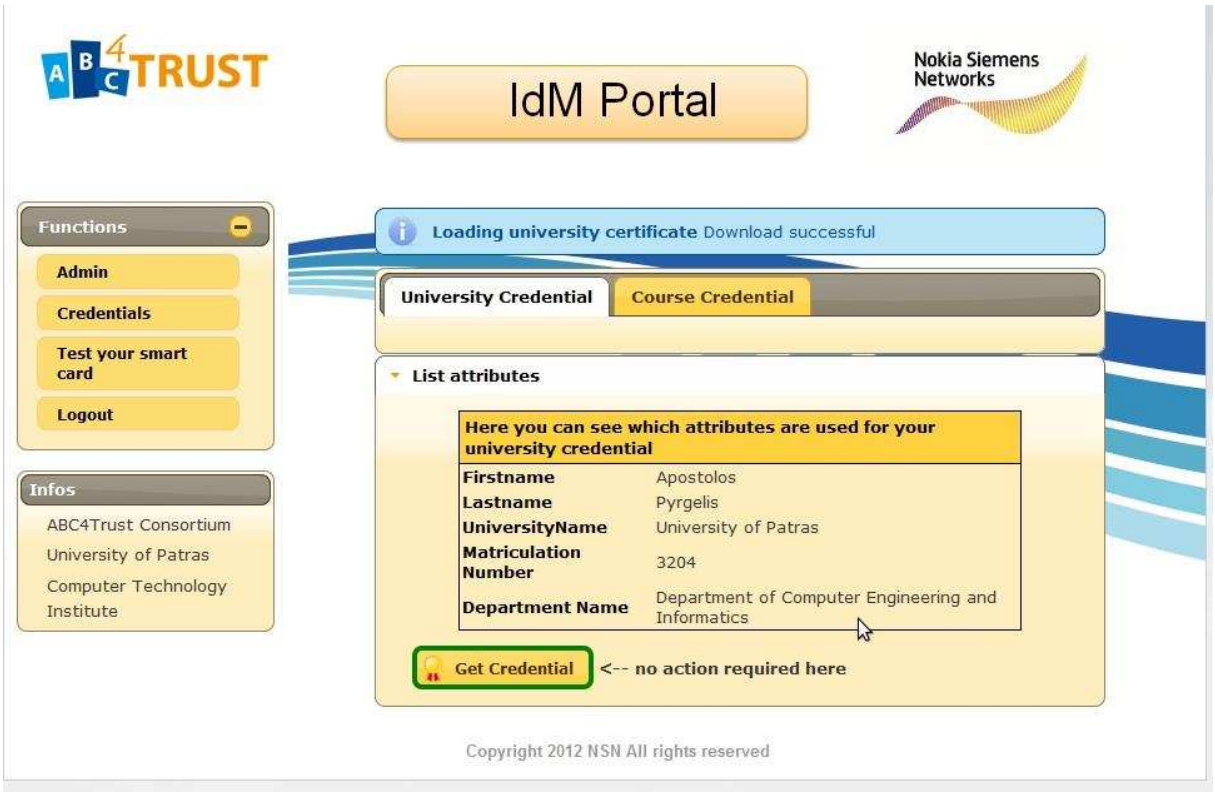

Figure 42: The University Credential obtained successfully

Troubleshooting Getting a University Credential

- ✓ If you cannot access your account at step 5, you have to check your smart card connection to your computer via your reader as the Figure 22 shows.
- ✓ If you cannot receive system's authentication at step 8 or get an error message, you have to check your smart card connection to your computer via your reader as the Figure 22 shows.
- ✓ If you cannot see successfully test your smart card (see Section 3.7), you have to repeat this procedure from the beginning.

3.6 How to Obtain a Course Registration Credential

Note:

- **When you want to book a course and obtain a valid course credential, you have to complete successfully the previous registration phase (see Section 3.4) and to possess a valid student Privacy-ABC credential following the steps of obtaining a university credential phase (see Section 3.5).**
- **You must have installed the ABC4Trust service at your computer.**
- **You have to plug the USB cable of card Reader to your computer and place the smart card into the card Reader as the Figure 6 shows.**

How to Obtain a Course Credential - Step 1:

Visit Patras Portal site at https://ces.cti.gr/Portal/Portal.html. You will see the following interface on your screen. Follow the link for "Get Credential".

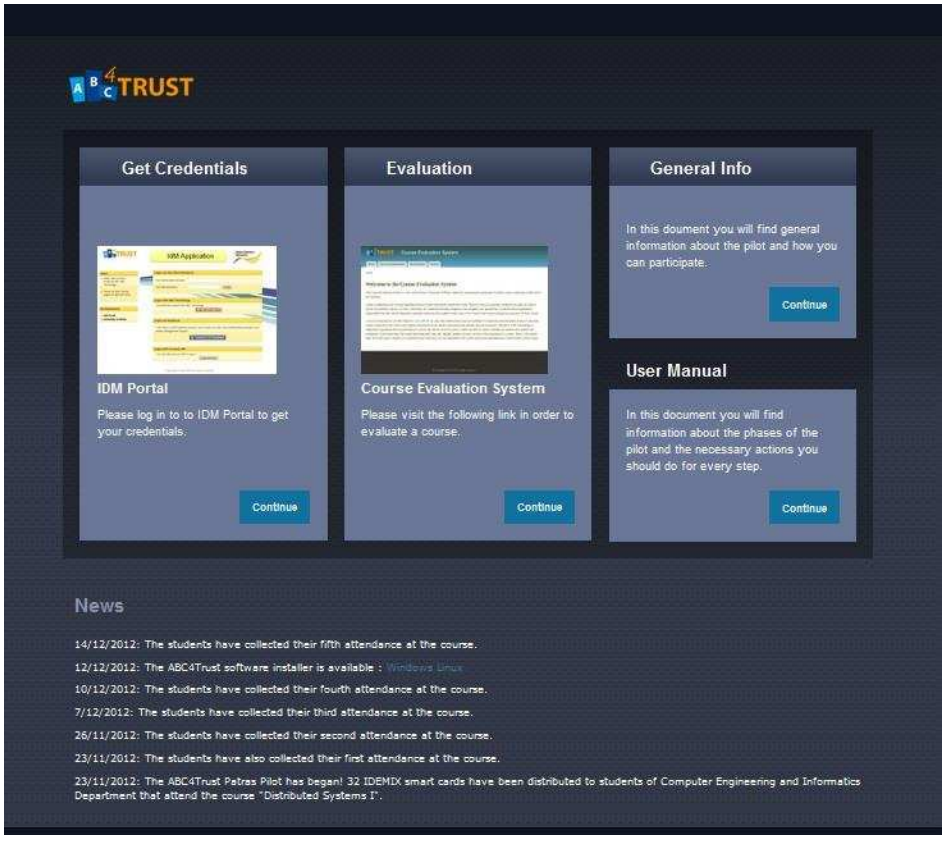

Figure 43: Patras Portal

How to Obtain a Course Credential - Step 2:

Now you are redirected to IdM Portal welcome page as shown in Figure 44. You need to login via ABC Technology. Select the 'log in with ABC token' tab as shown in in order to be logged in.

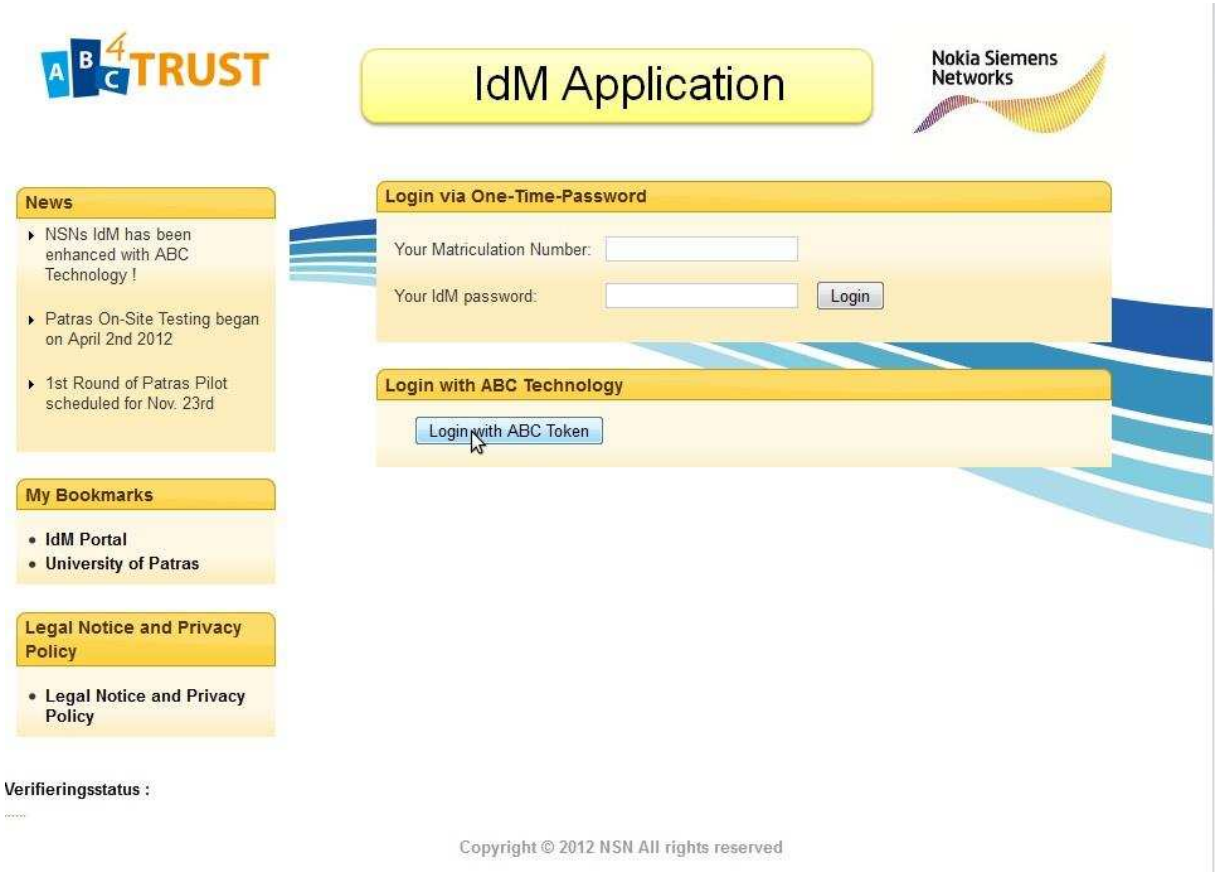

Figure 44: Log in with Privacy-ABC Token

How to Obtain a Course Credential – Step 3:

The ABC4Trust User Service application requests your PIN in order to unlock the card. Please enter your PIN in the corresponding box as Figure 45 shows and click the "OK" button.

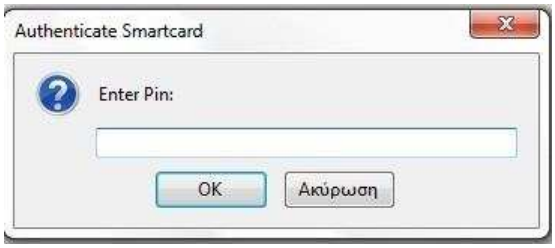

Figure 45: Smart Card PIN Authentication

How to Obtain a University Credential – Step 4:

Now the ABC4Trust Client application pops up and asks to select your policy for logging into the University Registration System. You have to select the following option:

☑ Pseudonyms: registration

Press Disclose to continue (see Figure 46).

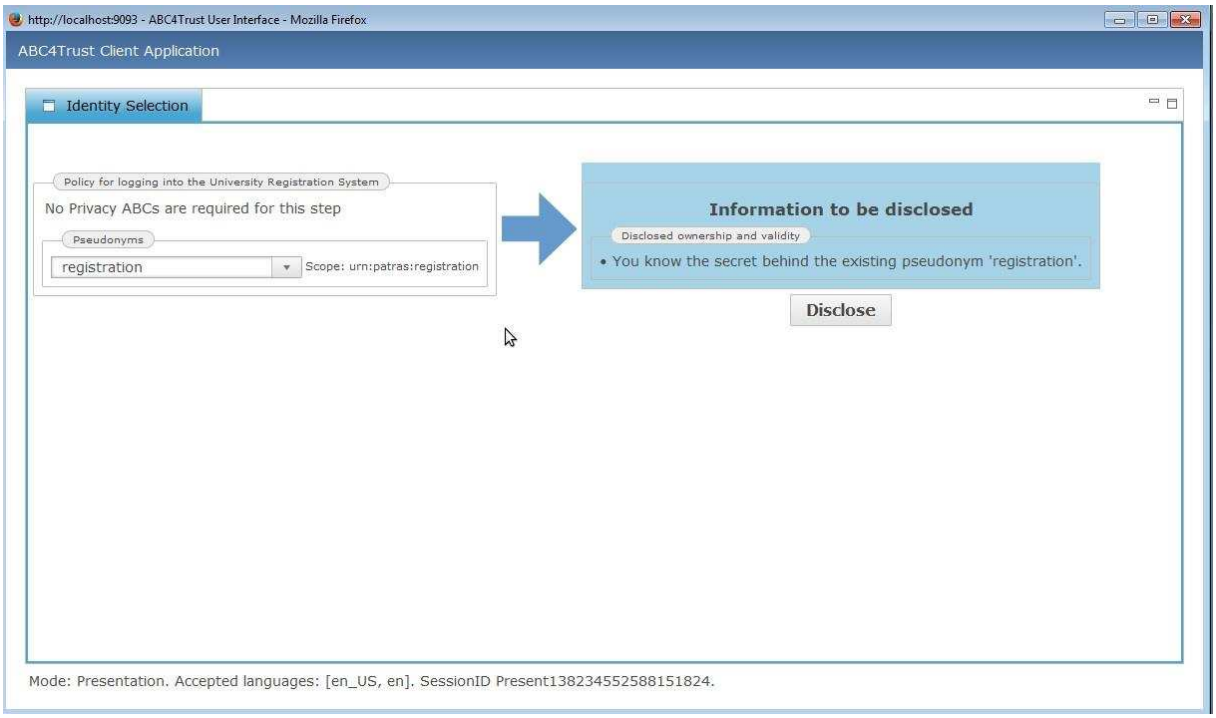

Figure 46: Identity Selection

How to Obtain a Course Credential - Step 5:

If the authentication is successful you will see your account page as shown in Figure 47. Now you can access your account information and all your attributes under the "Admin" menu.

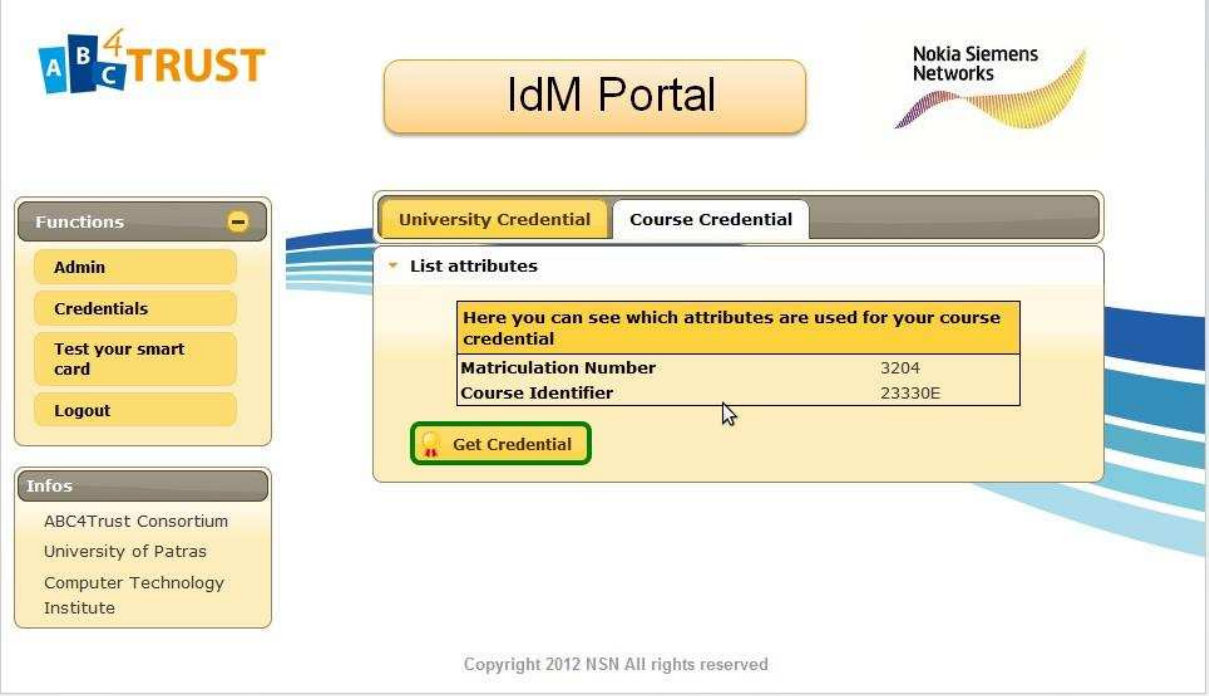

Figure 47: Credentials Environment

How to Obtain a Course Credential - Step 6:

At this point your account page must be similar with the page shown in Figure 47.

Now you can select "Credentials" link in the functions menu.

How to Obtain a University Credential – Step7:
Now the ABC4Trust Client application pops up and asks to select your policy for getting a University Credential. You have to select the following option:

- ☑ Pseudonyms: registration

You will be issued the following credential's properties:

- ☑ The credential is used by "urn:patras:issuer:credUniv:uprove" and is of type Course credential

Press Disclose & obtain credential to continue (Figure 48).

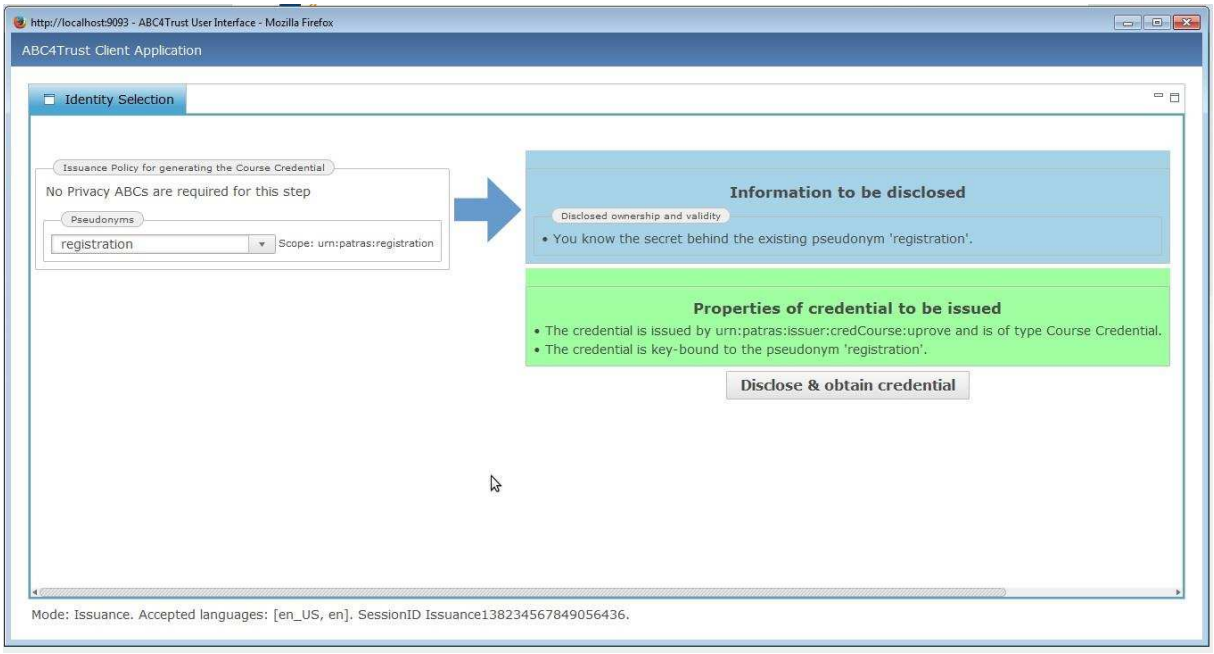

Figure 48: Credential Selection Window

How to Obtain a University Credential – Step 8:

The System authenticates you by using the stored data in your smart card. If your Course credential is stored in your smart card your credential status will be appeared as shown in Figure 42. In order to verify that the Course Credentials was successfully stored on your card you can view your stored Credentials (see Section 3.14).

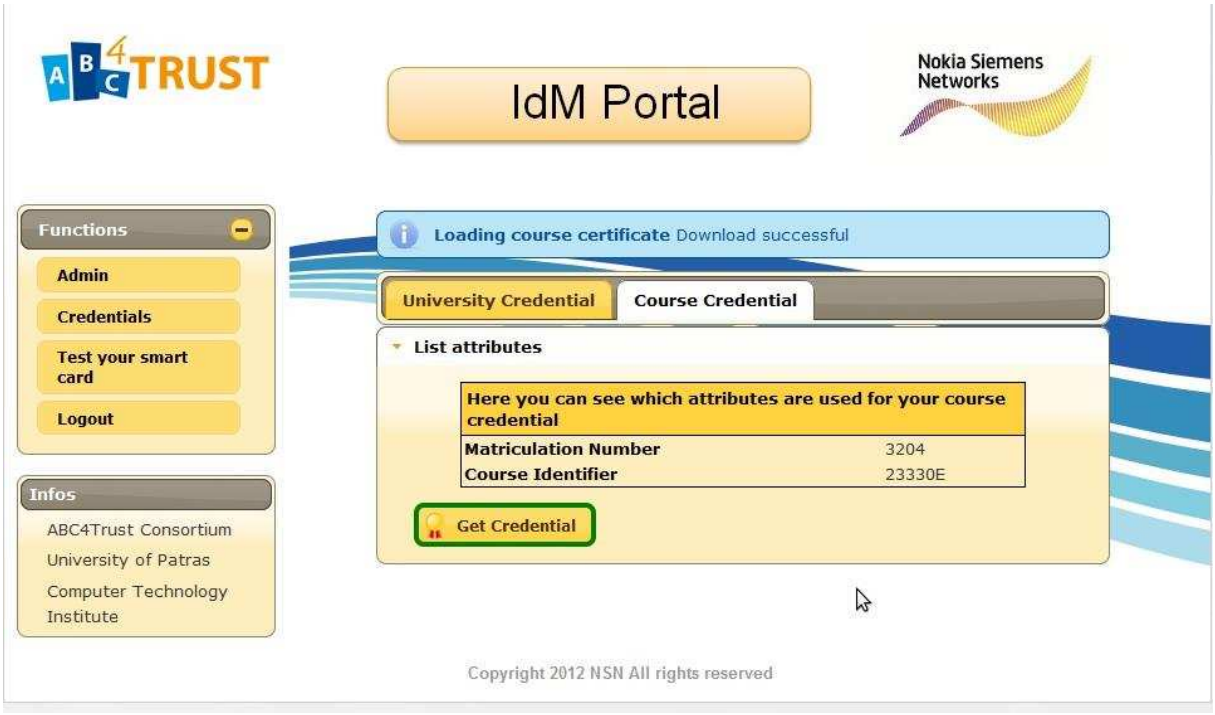

Figure 49: Your Course Credential Obtained Successfully

Troubleshooting Getting a Course Credential

- ✓ If you cannot access your account at step 5, you have to check your smart card connection to your computer via your reader.
- ✓ If you cannot receive system's authentication at step 8 or get an error message, you have to check your smart card connection to your computer via your reader.
- ✓ If you cannot see a course credential when you check the status of your smart card, you have to repeat this procedure from the beginning.

3.7 How to Test Your Smart Card

Each student has the ability to checks the validity of the University credential that is stored in his smart card. This operation is suggested to be done after you have got a University credential (see Section 3.5) and it proves that you have successfully obtained your University Credential.

Note:

- **When you want to book a course and obtain a valid course credential, you have to complete successfully the previous registration phase (see Section 3.4) and to possess a valid student Privacy-ABC credential following the steps of obtaining a university credential phase (see Section 3.5).**
- **You must have installed the ABC4Trust service at your computer.**
- **You have to plug the USB cable of card Reader to your computer and place the smart card into the card Reader as** the Figure 22 shows.

How to Test Your Smart Card - Step 1:

As soon as you have obtained a University Credential you can click on the button "Test your Smart Card" as shown in Figure 50.

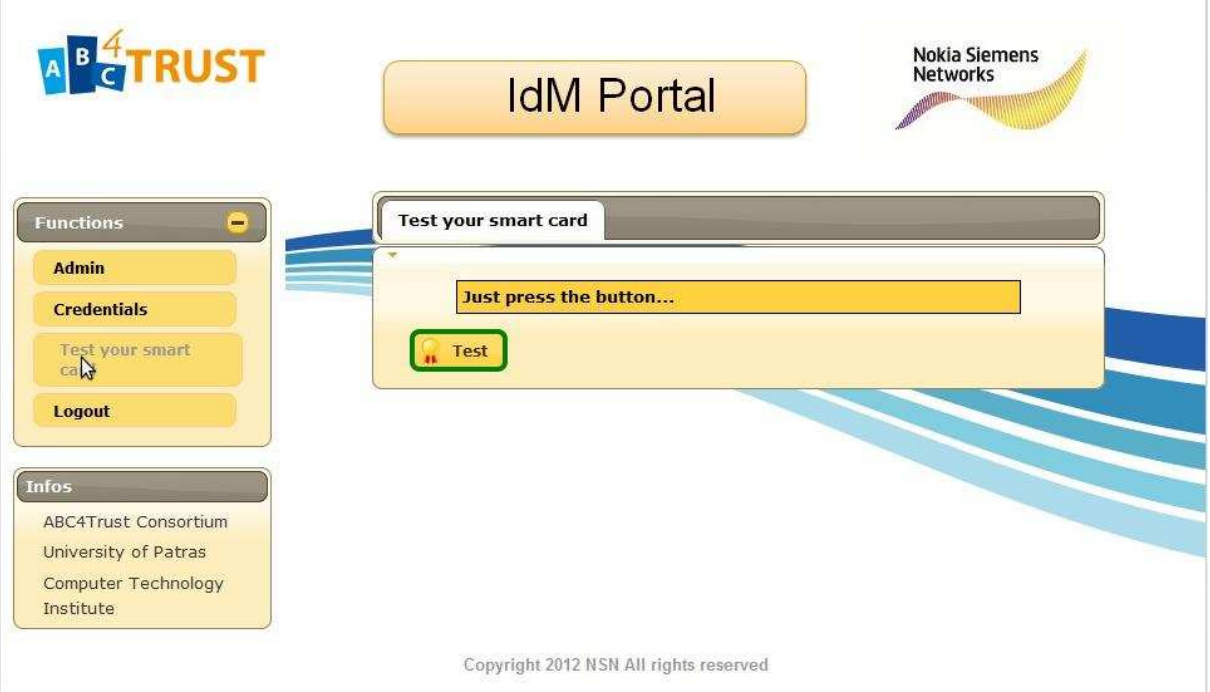

Figure 50: Test Your Smart Card

How to Test Your Smart Card - Step 2:

When clicking on this button, a verification protocol will take place. During this protocol the Identity Selector will pop-up (Figure 51) and inform you that you will present:

- ☑ Your pseudonym for registration
- ☑ Your University Credential
- ☑ Reveal your matriculation number from your University Credential

This test proves that you have successfully obtained your University Credential.

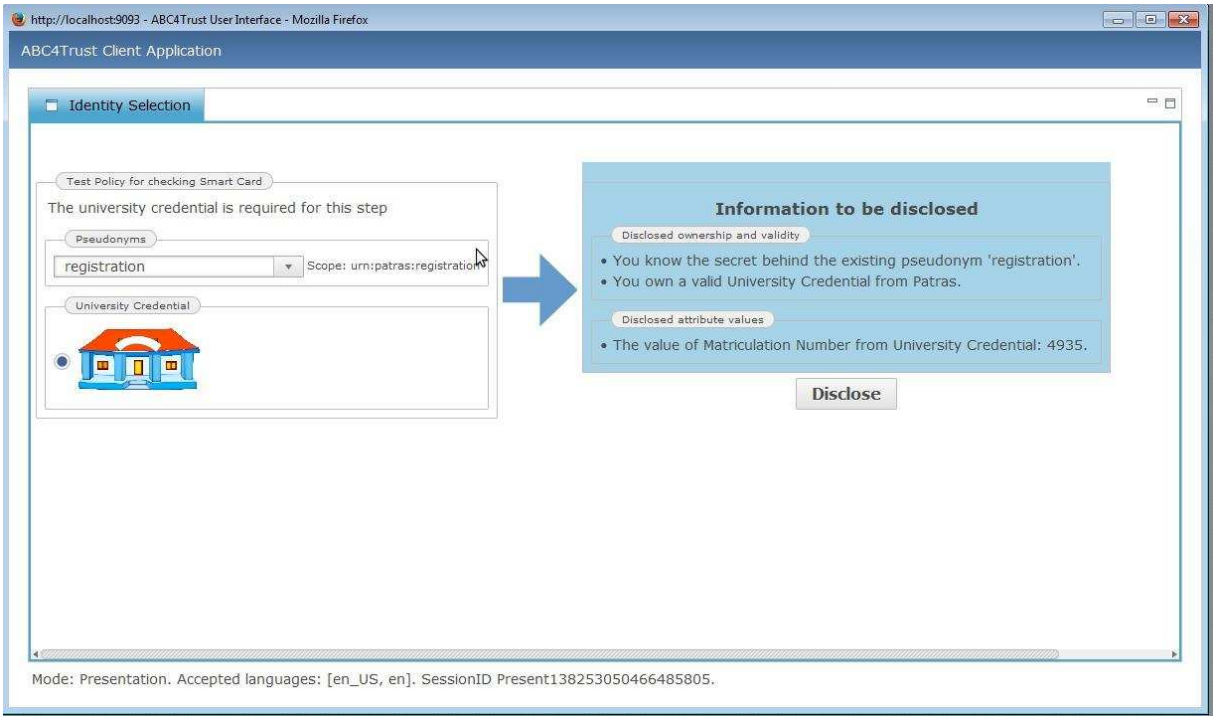

Figure 51: Identity Selector for Test your Smart Card

How to Test Your Smart Card - Step 3:

As soon as you click on the "Disclose" button, the screen of Figure 52 will appear. When your smart card has finished its computation click on "Ok".

Figure 52: Test your Smart Card Verification

How to Test Your Smart Card - Step 4:

When the verification protocol is over, you will be informed with a message "Test of Smart Card SUCCESSFUL" as the following figure shows.

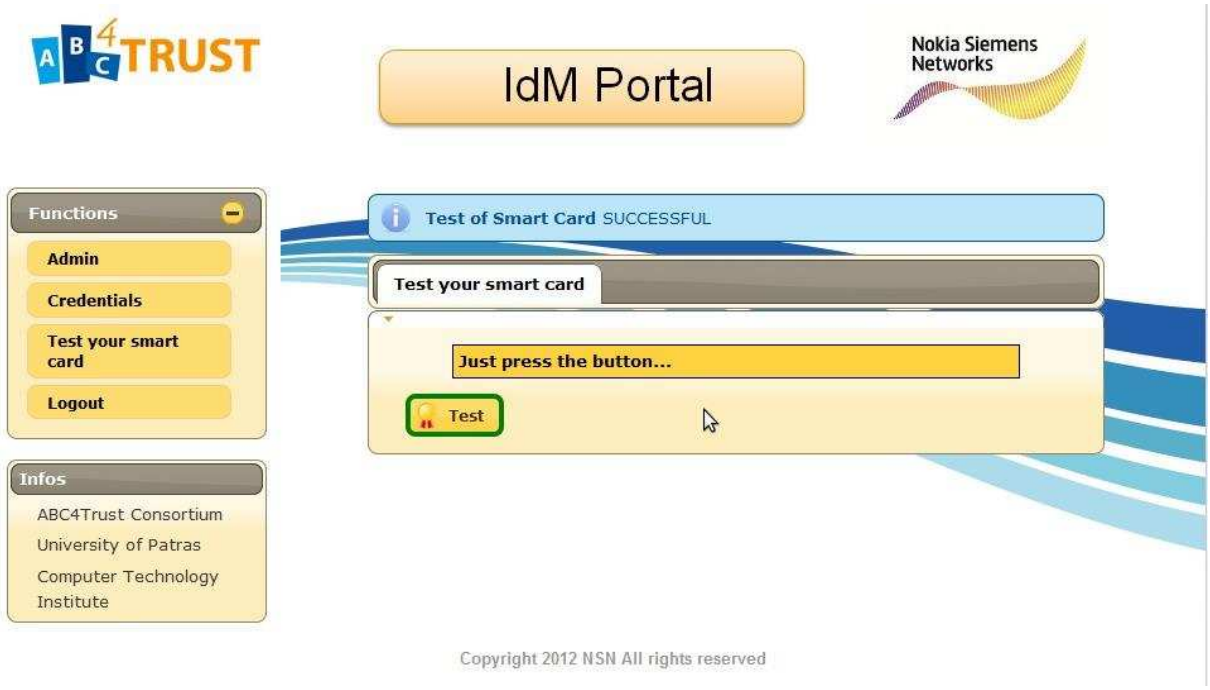

Figure 53: Test Your Smart Card was Successful

How to Test Your Smart Card - Step 4:

As soon as you complete your interaction with the University Registration System you can click on the "Logout" button.

Troubleshooting Test Your Smart Card

- ✓ If you cannot satisfy the policy for testing your smart card, please make sure that you have obtained a University Credential (see Section 3.14).

3.8 How to Obtain Your Class Attendance Data

Each student can collect his attendance information by waving his smart cart in front of a contactless NFC reader when leaving the lecturing room. NFC reader is responsible for storing attendance data on the students' smart cards during the lecture of a course. NFC reader will be placed in lecture room 15 minutes before lecture ends. The Professor is responsible for fixing the exact times when each lecture of the course is happening (location, date, start and finish time). CTI in cooperation with PhD students will be responsible for the Class Attendance System's operation and physical security.

Note:

- **You must have in your possession a smart card.**
- **You must have also a smart card reader.**
- **The class Attendance system is placed in lecture room.**

How to Obtain Class Attendance Data - Step 1:

You have to wave your smart cart in front of a contactless NFC reader when leaving the lecturing room, in order to collect your attendance information (see Figure 54). You will hear a voice signal (bit signal) for verifying you that your attendance has successfully stored in your smart card (see Figure 55). Your smart card is updated every time you attend a class.

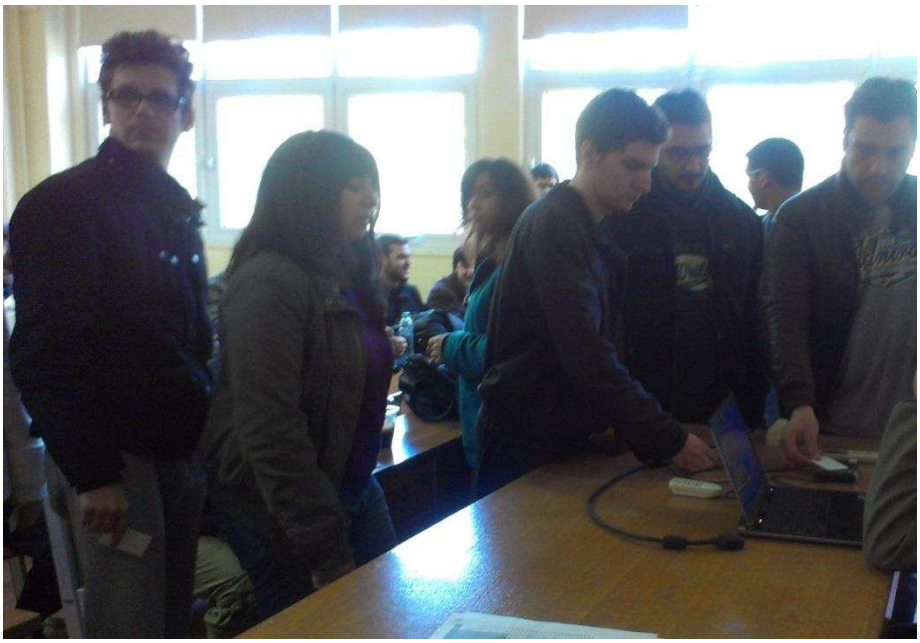

Figure 54: Waving the Smart card

Figure 55: The contactless NFC reader

3.9 How to View Your Attendance Units

Each student has the ability to view his attendance units that are stored in his smart card. This operation is suggested to be done before course evaluation and it displays the total number of attendance.

Note:

- **You must have attended some course lectures (see Section 3.8) and must have some attendance information stored on your smart card.**
- **You must have installed the ABC4Trust service at your computer.**
- **You have to plug the USB cable of card reader to your computer and place the smart card into the card reader as the Figure 22 shows.**

How to View Your Attendance Units - Step 1:

Open your web browser. You will see the following interface on your screen. Follow the tab "Tools" or "Εργαλεία" at your Firefox browser menu.

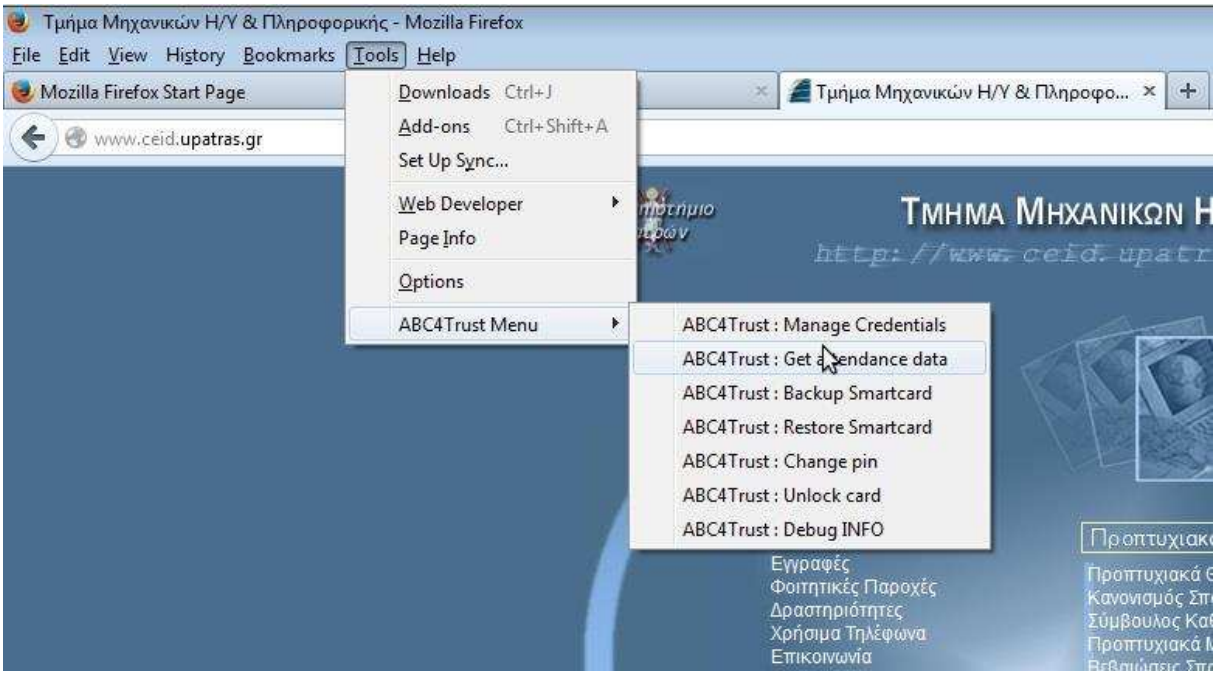

Figure 56: Web Browser Menu

How to View Your Attendance Units - Step 2:

Now select the "ABC4Trust Menu" tab under the Tools Menu as Figure 56 shows.

How to View Your Attendance Units - Step 3:

Now please select the "ABC4Trust: Get Attendance Data" tab under the ABC4Trust Menu as Figure 56 shows.

How to View Your Attendance Units – Step4:

The ABC4Trust User Service application requests your PIN in order to unlock the card. Please enter your PIN in the corresponding box as Figure 57 shows and click the "OK" button.

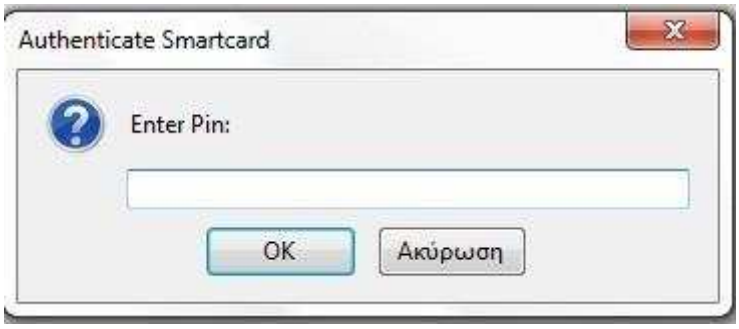

Figure 57: Smart Card PIN Authentication

How to View Your Attendance Units - Step 5:

Now you will be receive the following notification message that displays the total number of attendance units. Please click "OK" button.

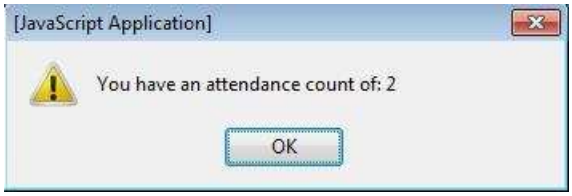

Figure 58: Total Number of attendance Units

3.10 How to Backup Your SC's Data

Each student has the ability to back up his smart card data. This operation is suggested to be done every time a lecture is attended and it ensures that there is no data loss in case a student's smart card is lost.

Note:

- **You must have attended some course lectures (see Section 3.8) and must have some attendance information stored on your smart card.**
- **You must have installed the ABC4Trust service at your computer.**
- **You have to plug the USB cable of card reader to your computer and place the smart card into the card reader as the Figure 22 shows.**

***How to Backup Your SC's Data* - Step 1:**

Open your web browser. You will see the following interface on your screen. Follow the tab "Tools" or "Εργαλεία" at your Firefox browser menu.

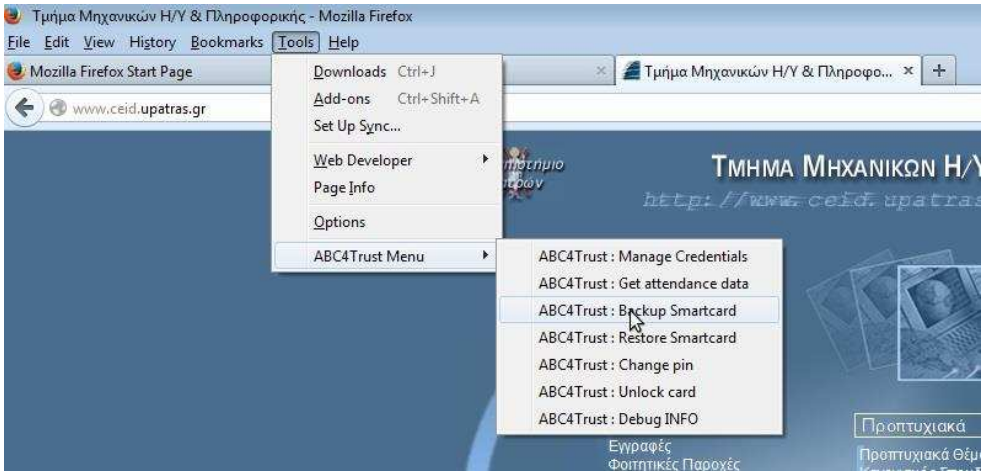

Figure 59: Web Browser Menu

How to Backup *Your SC's Data* - Step 2:

Now select the "ABC4Trust Menu" tab under the Tools Menu as Figure 59 shows.

***How to Backup Your SC's Data* - Step 3:**

Now please select the "ABC4Trust: Back Up Smartcard" tab under the ABC4Trust Menu as Figure 59 shows.

***How to Backup Your SC's Data* – Step4:**

The ABC4Trust User Service application requests your PIN in order to unlock the card. Please enter your PIN in the corresponding box as Figure 60 shows and click the "OK" button.

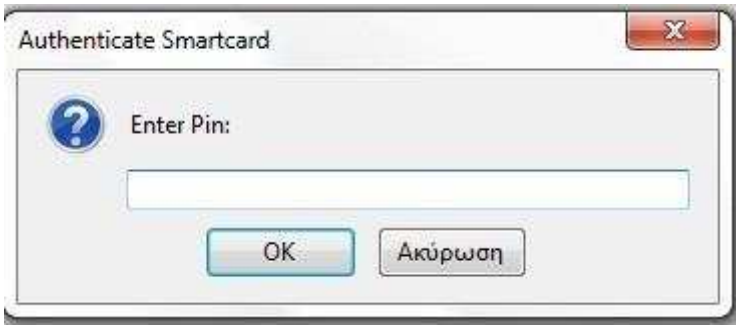

Figure 60: Smart Card PIN Authentication

***How to Backup Your SC's Data* - Step 5:**

At this point you have to select a password in order to encrypt your back up information.

Enter your password in the corresponding box as shown the below and click on "OK" button.

Figure 61: Selecting your Password

***How to Backup Your SC's Data* - Step 6:**

If your SC data has successfully stored at your PC you will see the following message and click the "OK" button.

Figure 62: Successful Back up

***How to Backup Your SC's Data* - Step 7:**

Your smart card backup file, should now be stored under the directory C:\Program Files\ABC4Trust\User Service\user_storage.

3.11 How to Restore SC's Data

If you lose your smart card then you can declare it lost to the University Registration Office where you can get a new envelope and smart card. You must have a backed up smart card content on your PC in order to be able to restore backed up data from your PC on your (new) SC though User Agent application. Note that the PIN and your password for backup and restore can be selected by the user, thus may be different from the PIN for unlocking the SC.

Note:

- **If you have lost your smart card then you have to declare the smart card loss to the University Registration Office and to get a new envelope and a new smart card.**
- **You have a backup on your PC,** you must have a **backup *file"***smartcard_backup_smartcardID.bac***" stored in your PC under the directory C:\Program Files\ABC4Trust\User Service\user_storage.**
- **You have to plug the USB cable of card Reader to your computer and place the new smart card into the card reader as the Figure 22 shows.**
- **You must have installed the ABC4Trust service at your computer.**

How to Restore *Your SC's Data* - Step 1:

Open your Firefox browser. You will see the following interface on your screen. Follow the tab "Tools" or "Εργαλεία" at your Firefox browser menu.

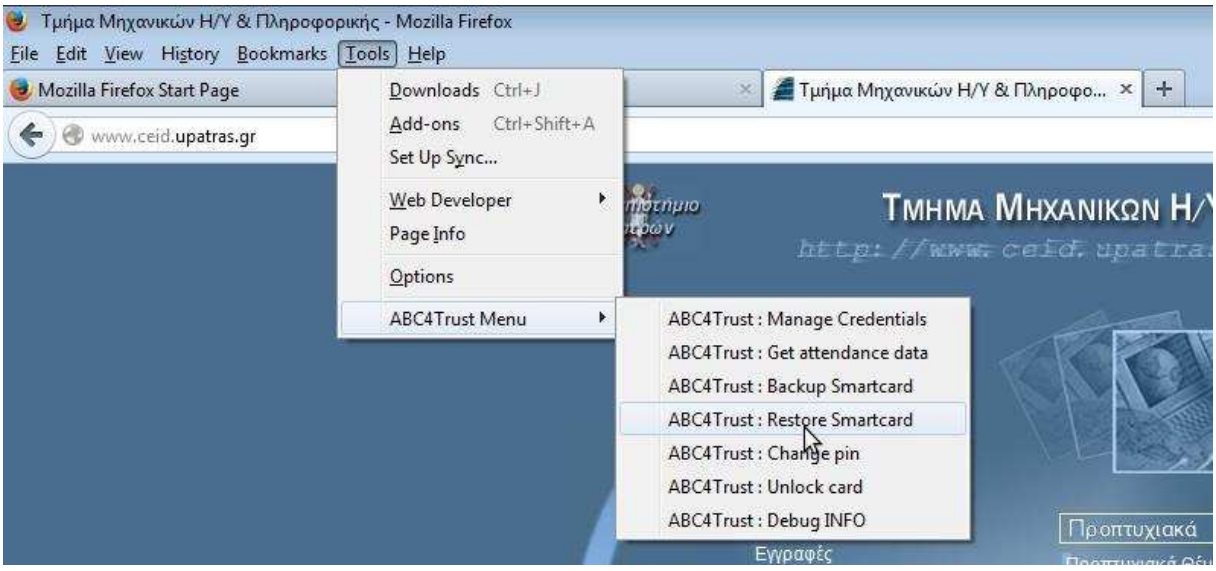

Figure 63: Web Browser Menu

How to Restore *Your SC's Data* - Step 2:

Now select the "ABC4Trust Menu" tab under the Tools Menu as Figure 63 shows.

How to Restore *Your SC's Data* - Step 3:

Now please select the "ABC4Trust: Restore Smartcard" tab under the ABC4Trust Menu as Figure 63 shows.

How to Restore *Your SC's Data* – Step4:

The ABC4Trust User Service application requests your PIN in order to unlock the card. Please enter your PIN in the corresponding box as Figure 64 shows and click the "OK" button.

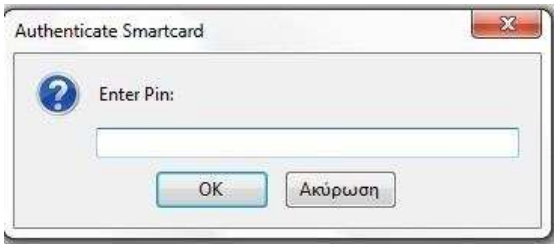

Figure 64: Smart Card PIN Authentication

How to Restore *Your SC's Data* - Step 5:

At this point you have to enter your password (that you selected at step 5 see Section 3.10) in order to decrypt your back up information.

Enter your password in the corresponding box as shown the below and click on "OK" button.

Figure 65: Entering your Password for the Backup File

How to Restore *Your SC's Data* - Step 7:

If your stored data has successfully restored at your smart card you will see the following message

Figure 66: Successful Smart Card Restore

How to Restore *Your SC's Data* - Step 8:

Finally, please restart your computer in order for the ABC4Trust User Service to be restarted.

3.12 How to Change Your PIN

Each student can change his smart card PIN.

Note:

- **You must have installed the ABC4Trust service at your computer.**
- **You have to plug the USB cable of card reader to your computer and place the smart card into the card reader as the Figure 22 shows.**

How to change tour PIN- Step 1:

Open your Firefox browser. You will see the following interface on your screen. Follow the tab "Tools" or "Εργαλεία" at your Firefox browser menu.

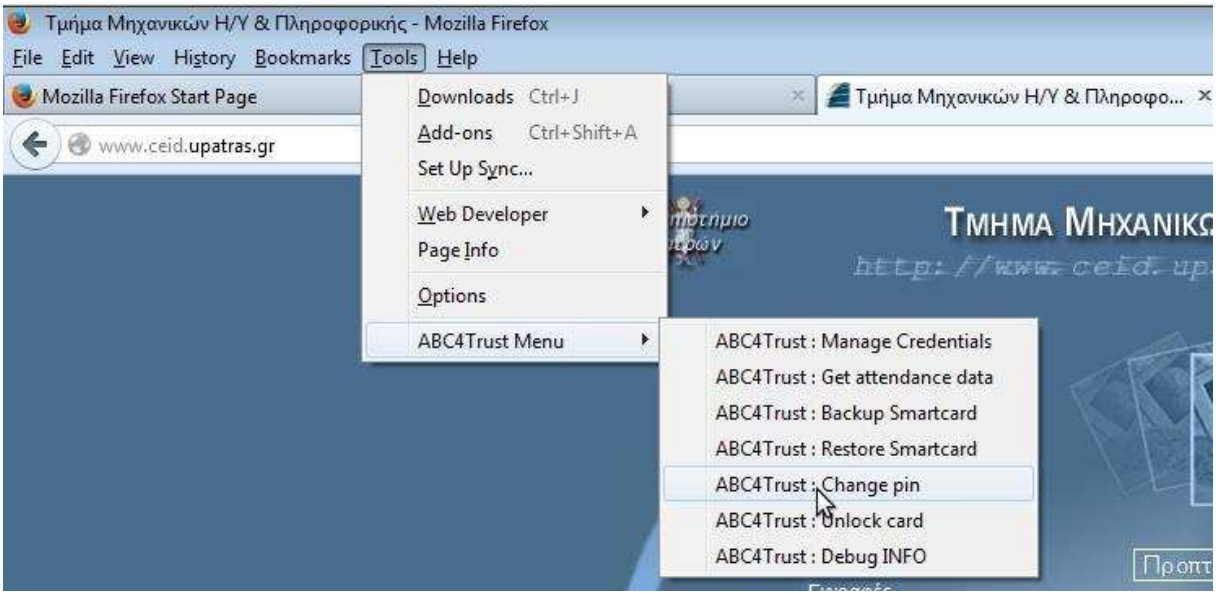

Figure 67: Web Browser Menu

How to to change tour PIN - Step 2:

Now select the "ABC4Trust Menu" tab under the Tools Menu as Figure 67 shows.

How to to change tour PIN - Step 3:

Now please select the "ABC4Trust: Change pin" tab under the ABC4Trust Menu as Figure 67 shows.

How to to change tour PIN - Step 4:

Now you will receive the following notification message.

Figure 68: Notification Message

How to to change tour PIN - Step 5:

The ABC4Trust User Service application requests your current PIN in order to unlock the card. Please enter your current PIN in the corresponding box as Figure 69 shows and click the "OK" button.

Figure 69: Enter your current PIN

How to to change tour PIN - Step 6:

Now, please enter your new PIN in the corresponding box as Figure 70 shows and click the "OK" button.

Note:

Figure 70: Enter your new PIN

How to to change tour PIN - Step 7:

If your PIN has been successfully changed you will see the following message and select "OK".

Figure 71: PIN changed

3.13 How to Unlock Your Smart Card

Each student can unlock his smart card after it has been locked. A smart card can get locked, if its holder enters a wrong PIN three times in a row.

- **You must have installed the ABC4Trust service at your computer.**
- **You have to plug the USB cable of card reader to your computer and place the smart card into the card reader as the Figure 22 shows.**

How to Unlock Your Smart Card- Step 1:

Open your Firefox browser. You will see the following interface on your screen. Follow the tab "Tools" or "Εργαλεία" at your Firefox browser menu.

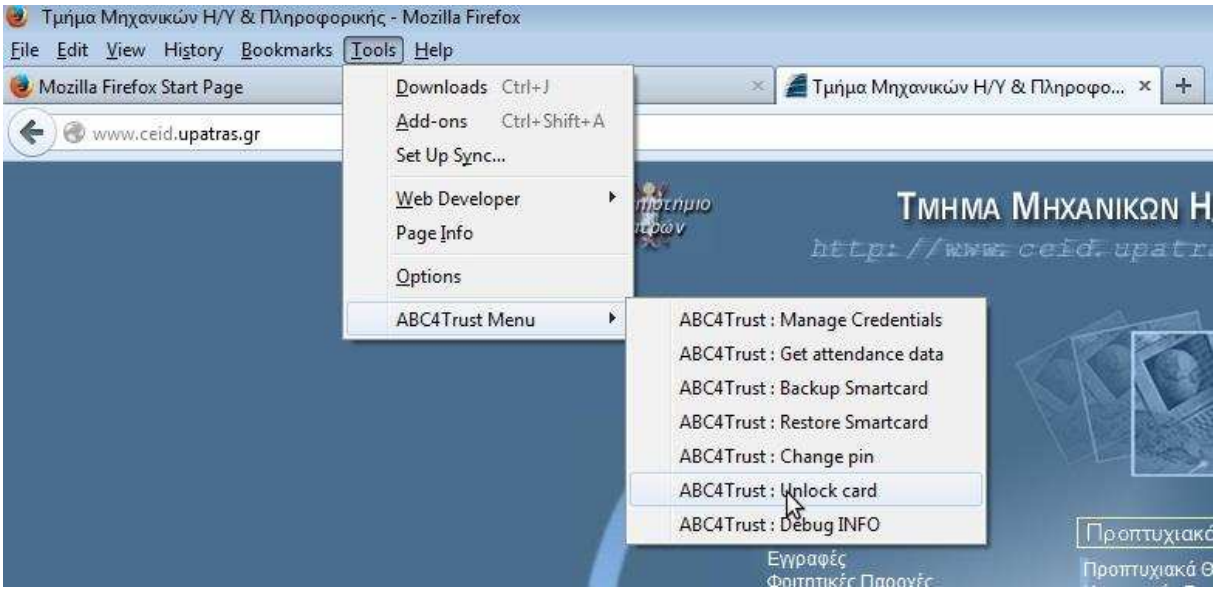

Figure 72: Web Browser Menu

How to Unlock Your Smart Card - Step 2:

Now select the "ABC4Trust Menu" tab under the Tools Menu as Figure 72 shows.

How to Unlock Your Smart Card - Step 3:

Now please select the "ABC4Trust: Unlock card" tab under the ABC4Trust Menu as Figure 72 shows.

How to Unlock Your Smart Card - Step 4:

Now you will receive the following notification message.

Figure 73: Notification Message

How to Unlock Your Smart Card - Step 5:

The ABC4Trust User Service application requests your PUK. Please enter your PUK (it is included in the sealed envelope see Figure 7) in the corresponding box as Figure 74 shows and click the "OK" button.

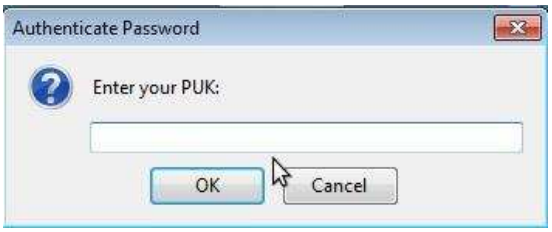

Figure 74: Enter your PUK

How to Unlock Your Smart Card - Step 6:

Now, please enter your new PIN in the corresponding box as Figure 75 shows and click the "OK" button.

Figure 75: Enter your new PIN

How to Unlock Your Smart Card - Step 7:

If your SC is unlocked successfully and you will see the following message and select "OK".

Figure 76: PIN has been changed

3.14 How to View Your Credentials

Each student can browse his attribute based credentials that are stored on his smart card.

Note:

- **You must have installed the ABC4Trust service at your computer.**
- **You have to plug the USB cable of card reader to your computer and place the smart card into the card reader as the Figure 22 shows.**

How to View Your Credentials- Step 1:

Open your Firefox browser. You will see the following interface on your screen. Follow the tab "Tools" or "Εργαλεία" at your Firefox browser menu.

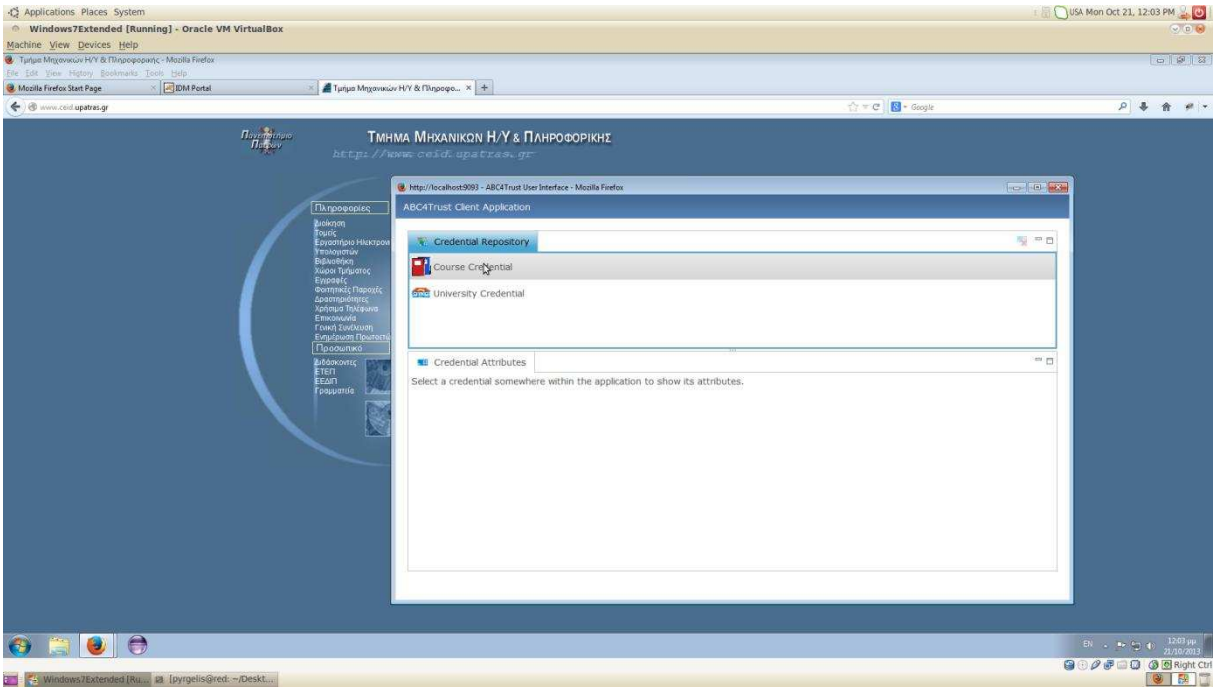

Figure 77: Web Browser Menu

How to View Your Credentials - Step 2:

Now select the "ABC4Trust Menu" tab under the Tools Menu as Figure 77 shows.

How to View Your Credentials - Step 3:

Now please select the "ABC4Trust: Manage Credentials" tab under the ABC4Trust Menu as Figure 77 shows.

How to View Your Credentials - Step 4:

Now, please enter your PIN in the corresponding box as Figure 78 shows and click the "OK" button.

Figure 78: Enter your PIN

How to View Your Credentials --Step 5:

Now you will be able to see the following interface which shows your stored credentials on your smart card.

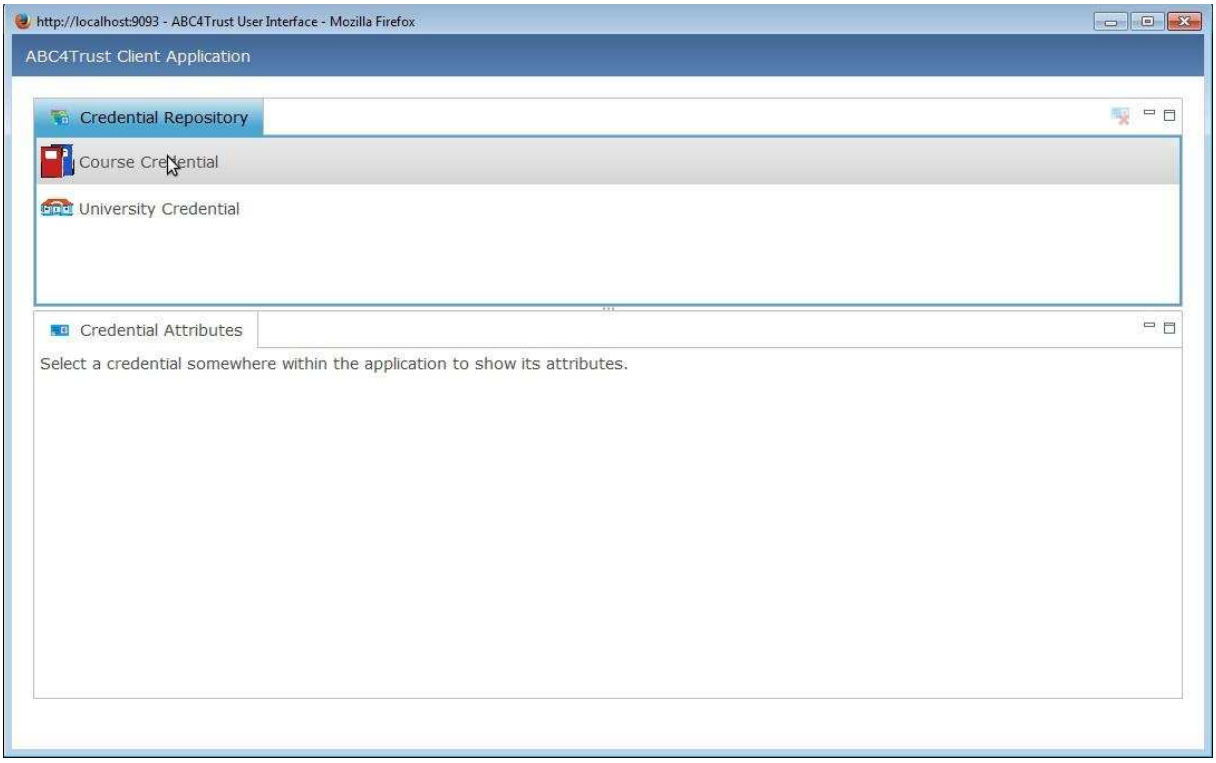

Figure 79: List of Credentials

How to View Your Credentials --Step 6:

Now select the "University Credential" tab (in Figure 79) in order to see that your Credential:

- ☑ Is of type of University Credential
- ☑ Has been issued by Patras (urn:patras:issuer:credUniv:Idemix)
- ☑ Is not been revoked
- ☑ Belongs to you

At this point you should be seeing the page shown in the figure below.

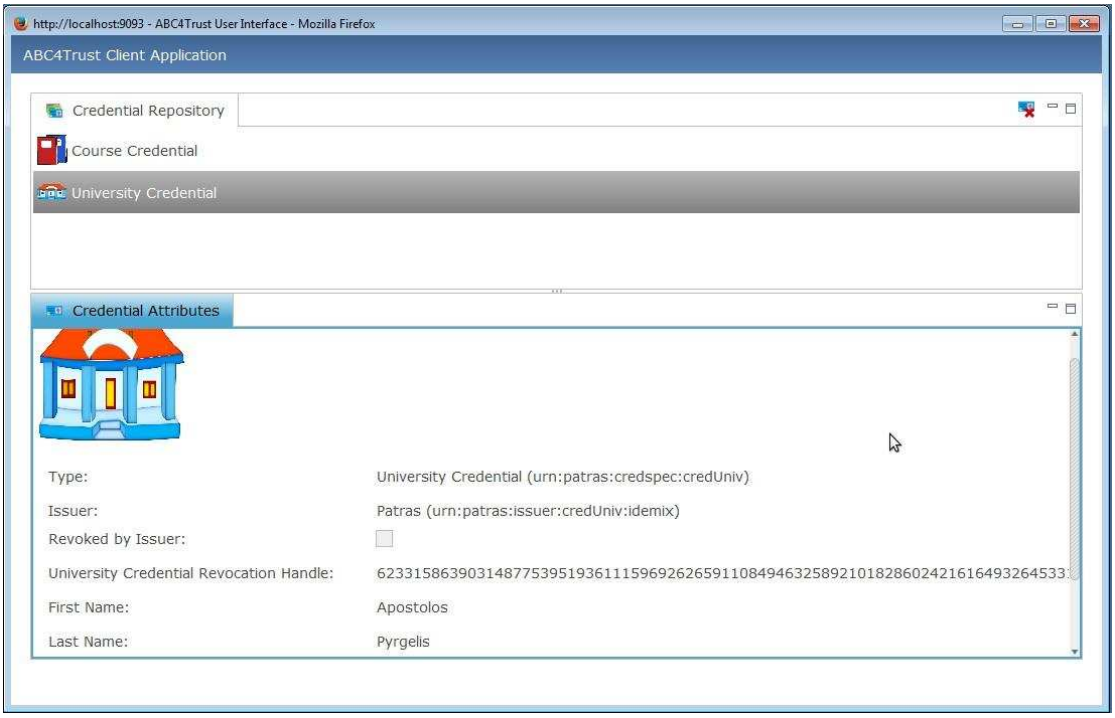

Figure 80: View University Credential

How to View Your Credentials --Step 7:

Now select the "Course Credential" tab (in Figure 79) in order to see that your Credential:

- ☑ Is of type of Course Credential
- ☑ Has been issued by Patras (urn:patras:issuer:credUniv:uprove)
- ☑ Is not revocable
- ☑ Has the id of your enrolled course

At this point you should be seeing the page shown in the figure below.

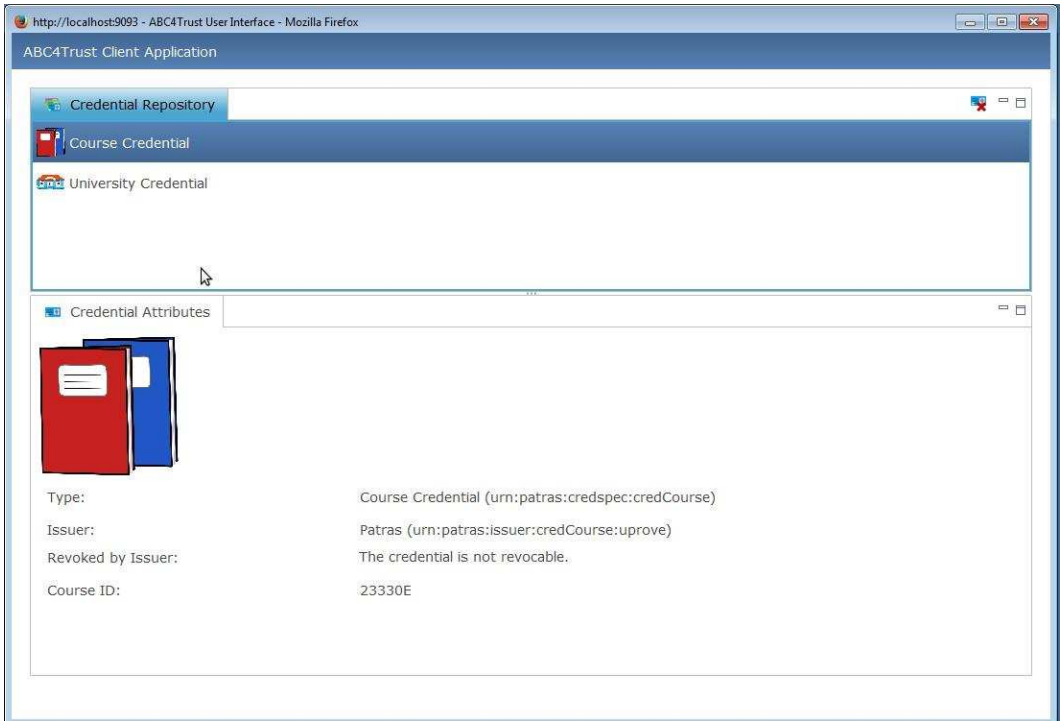

Figure 81: View the contents of your Course Credential

3.15 How to Delete Your Credentials

Each student can delete his attribute based credentials that are stored on his smart card.

Note:

- **You must have installed the ABC4Trust service at your computer.**
- **You have to plug the USB cable of card reader to your computer and place the smart card into the card reader as the Figure 22 shows.**

How to Delete Your Credentials- Step 1:

Open your Firefox browser. You will see the following interface on your screen. Follow the tab "Tools" or "Εργαλεία" at your Firefox browser menu.

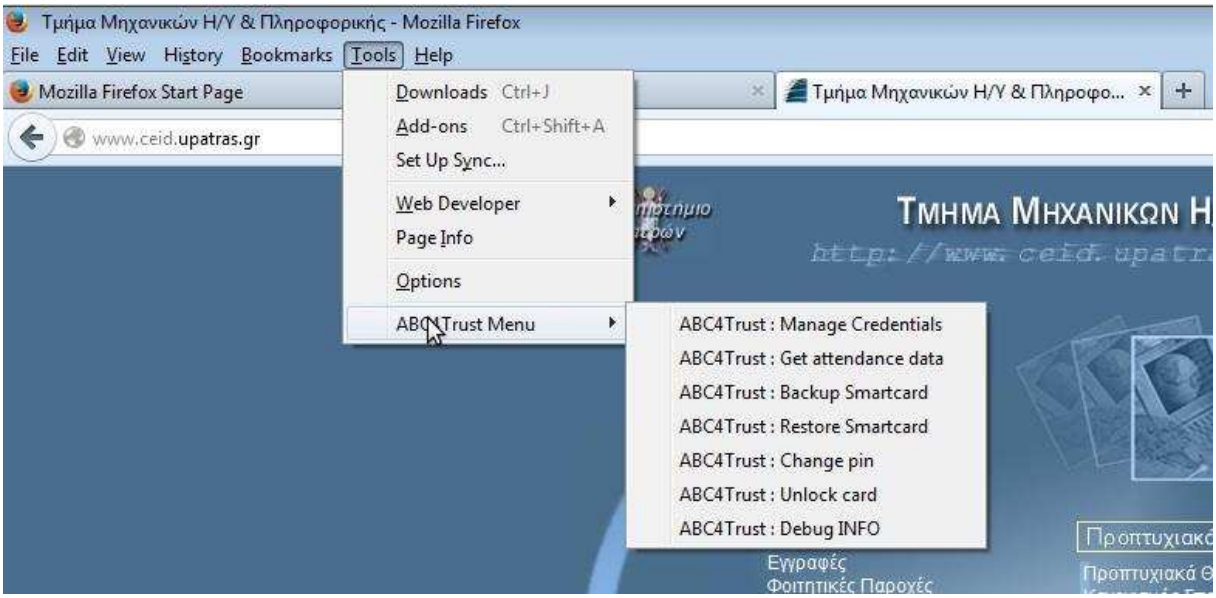

Figure 82: Web Browser Menu

How to Delete Your Credentials - Step 2:

Now select the "ABC4Trust Menu" tab under the Tools Menu as Figure 82 shows.

How to Delete Your Credentials - Step 3:

Now please select the "ABC4Trust: Manage Credentials" tab under the ABC4Trust Menu as Figure 82 shows.

How to Delete Your Credentials - Step 4:

Now, please enter your PIN in the corresponding box as Figure 83Figure 70 shows and click the "OK" button.

Figure 83: Enter your PIN

How to Delete Your Credentials --Step 5:

Now you will be able to see the following interface which shows your stored credentials on your smart card.

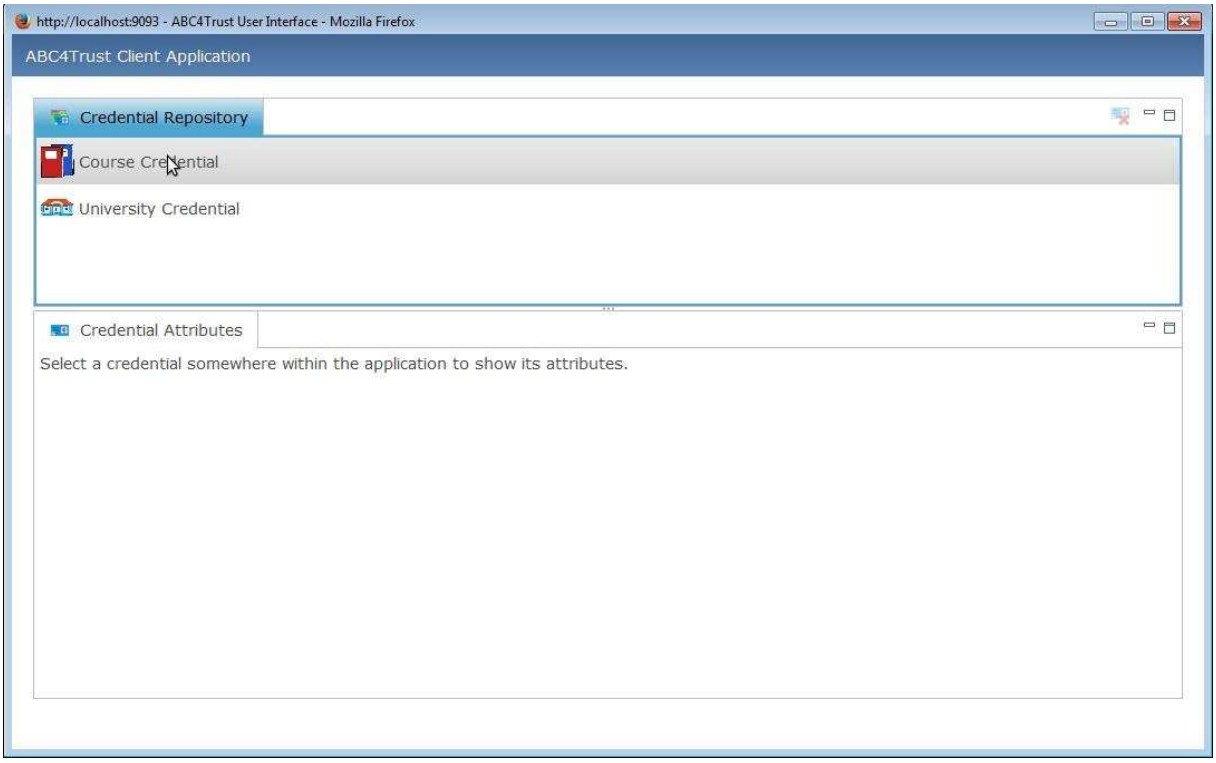

Figure 84: List of Credentials

How to Delete Your Credentials --Step 6:

At this point you have to select the credential that you want to delete (e.g. The course credential). Please click on the "Delete" link on the right corner of this page as Figure 85 shows. Then click the "Yes" to delete the selected credential.

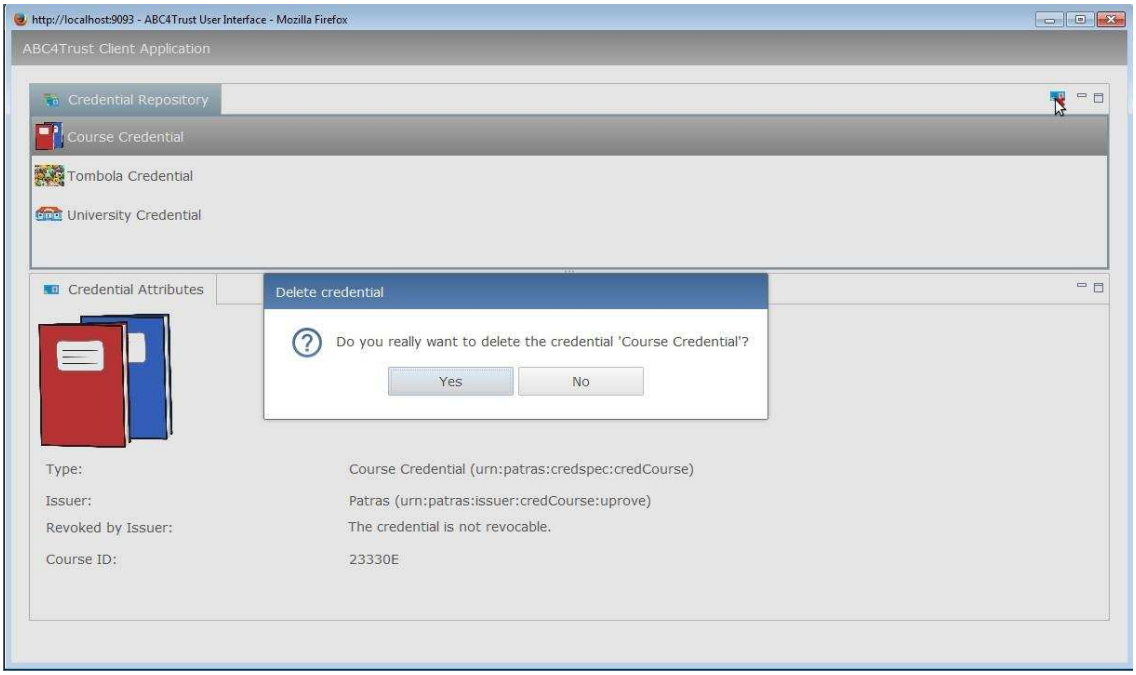

Figure 85: Delete a Credential

How to Delete Your Credentials --Step 7:

Now your selected credential was deleted from your list of credentials as Figure 86 shows.

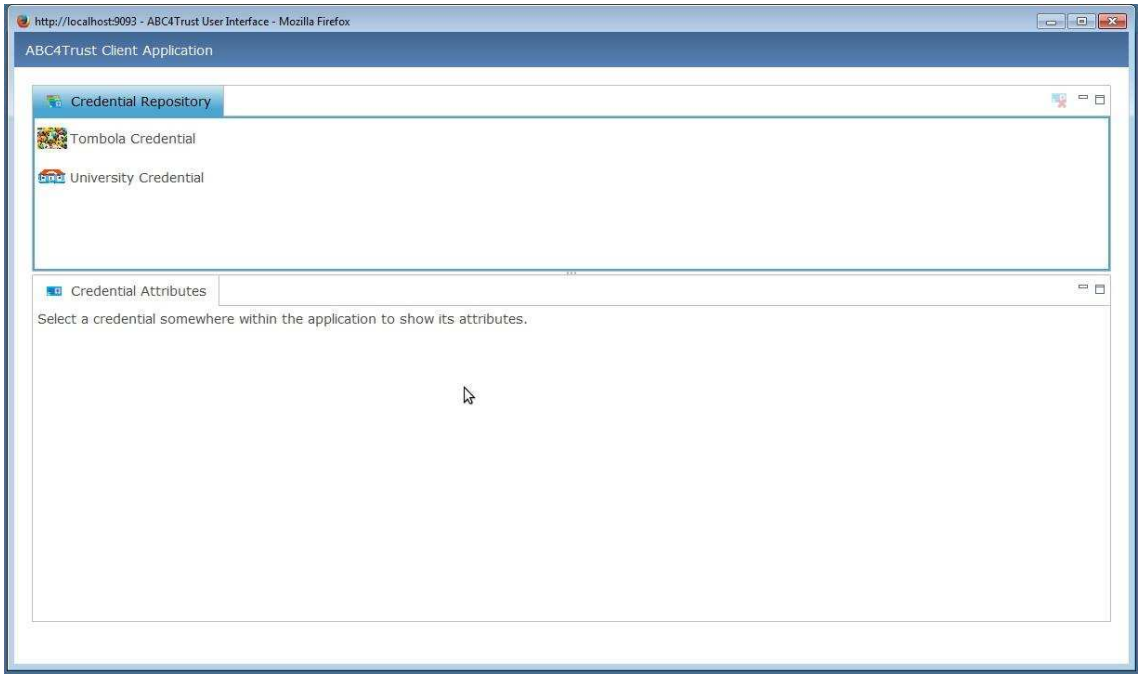

Figure 86: The updated List of Credentials

3.16 How to Evaluate a Course and Obtain a Tombola Credential

You will be able to participate anonymously in a course evaluation by logging in to the Course Evaluation System via Privacy-ABC technology. When you want to evaluate a course you need to follow the steps described in this section.

Note:

- **You must have at your possession a valid university credential and one or more course credentials (following the steps described in Sections 3.5 and 3.6).**
- **You must have attended at least 3 lectures of the course since you have to prove sufficient attendance of a specific course in order to evaluate the course (In order to see the number of your attendance data see Section 3.9).**
- **You must have installed the ABC4Trust service at your computer.**
- **You have to plug the USB cable of card reader to your computer and place the smart card into the card reader.**
- **You must have installed the Privacy-ABC User Agent on your computer in order to start the course evaluation procedure.**

3.16.1 Setup Your Browser Before Accessing the Course Evaluation System

This phase describes the necessary steps you should follow in order to setup your web browser before interacting with the Course Evaluation System.

How to Setup Your Web Browser - Step 1:

Visit the Course Evaluation System at https://ces.cti.gr/. Now, you will see the following notification and follow the "I Understand the Risks" link.

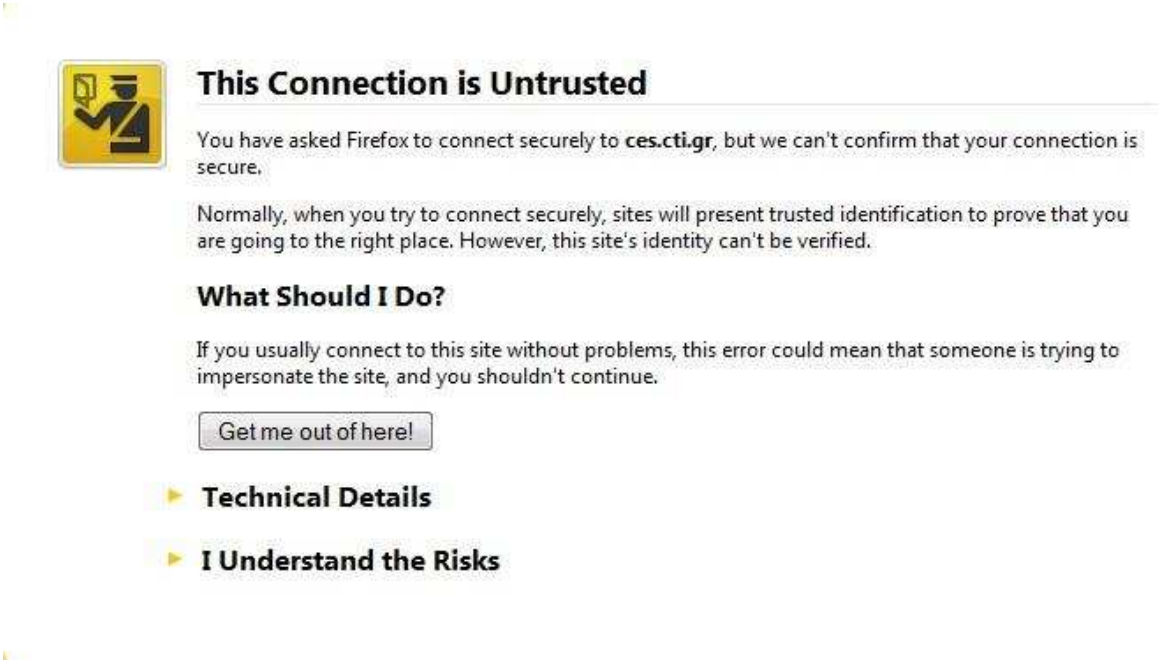

Figure 87: Add CES Certificate

How to Setup Your Web Browser - Step 2:

Now you can see the following interface and you must select the "Add Exception" tab at the bottom of the window as Figure 88 shows.

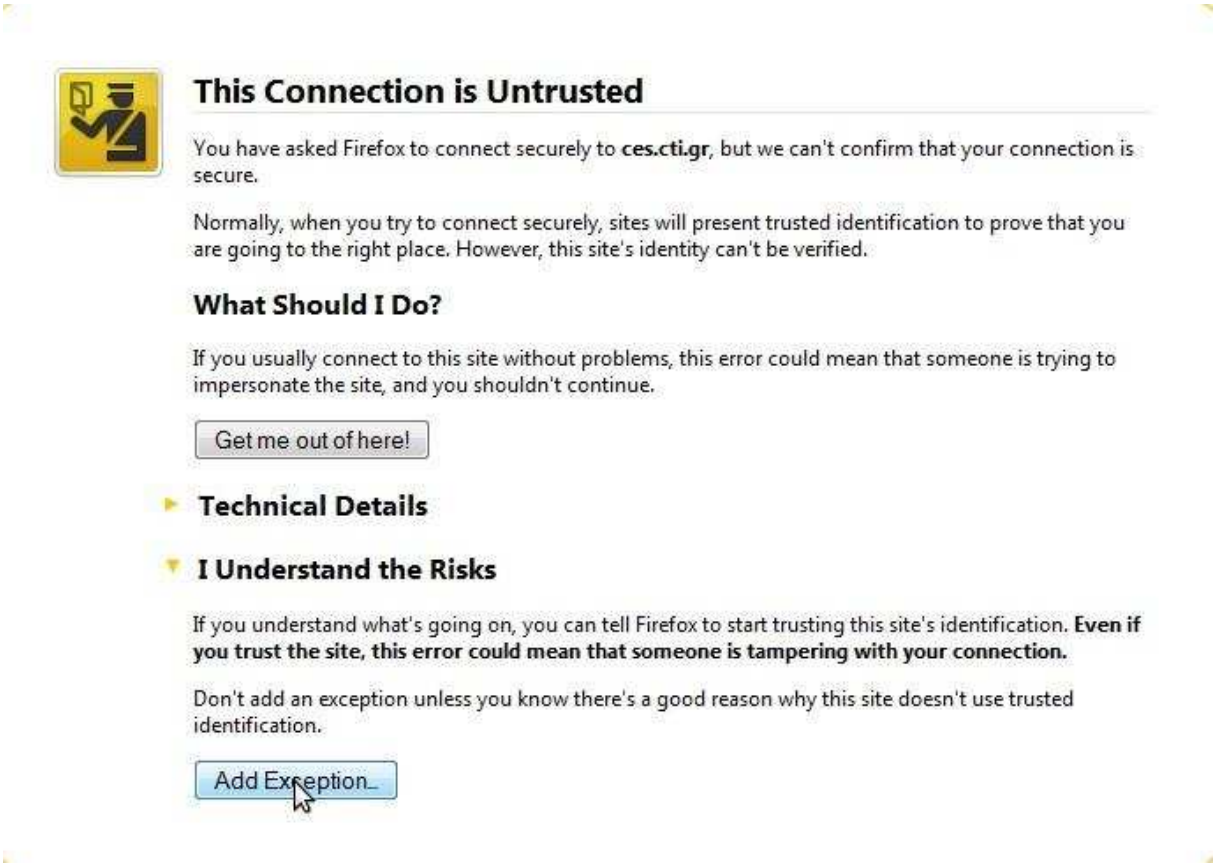

Figure 88: Add Exception

How to Setup Your Web Browser - Step 3:

Please click on the "Get Certificate" button and then click on the "Confirm Security Exception" button. The front page of the Course Evaluation System will now appear.

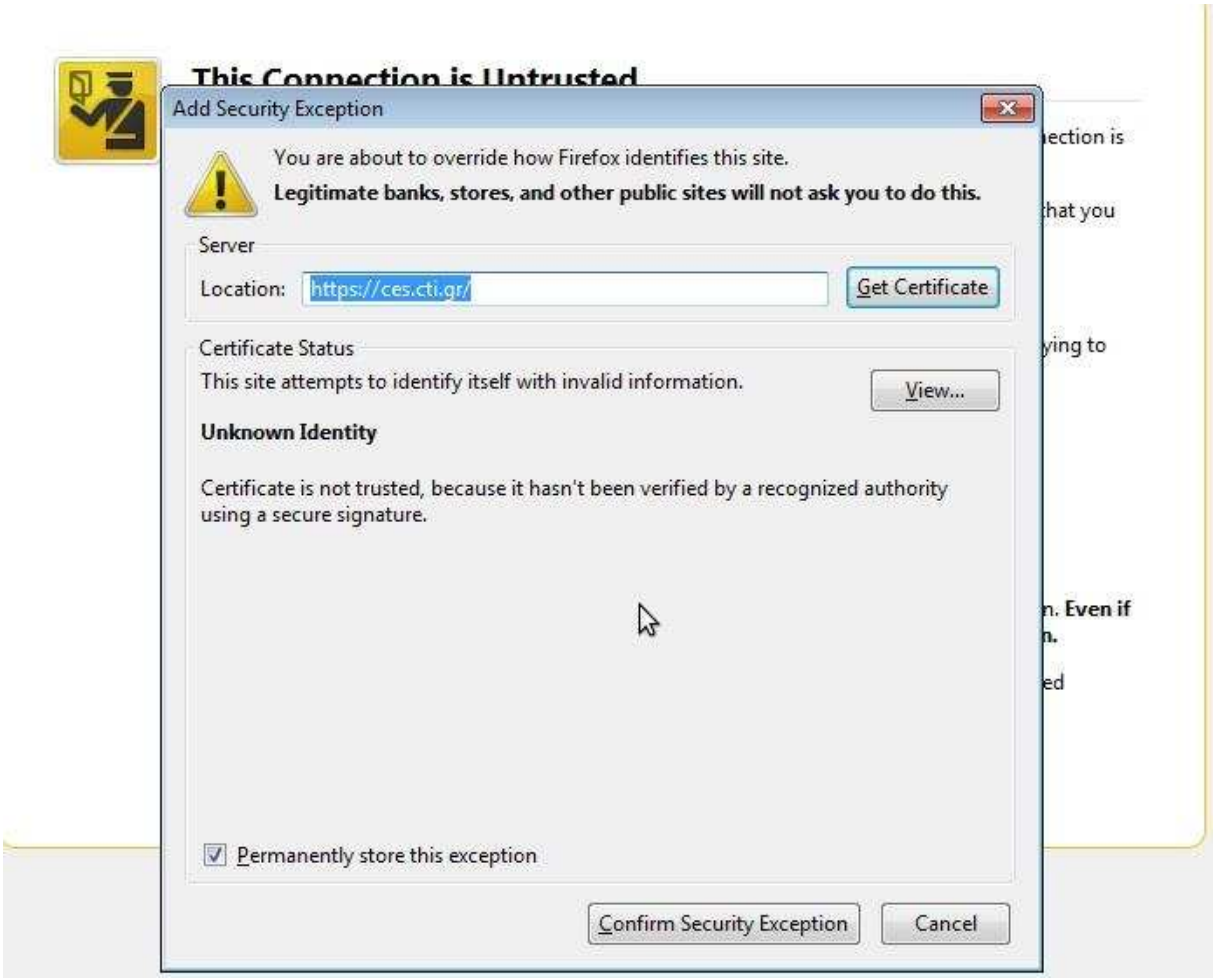

Figure 89: Add Security Exception

Additionally, you need to add manually a security exception for the link https://ces.cti.gr:8443/. Please, follow the instructions below:

How to Setup Your Web Browser - Step 4:

Open your Firefox browser. You will see the following interface on your screen. Follow the tab "Tools" or "Εργαλεία" at your Firefox browser menu.

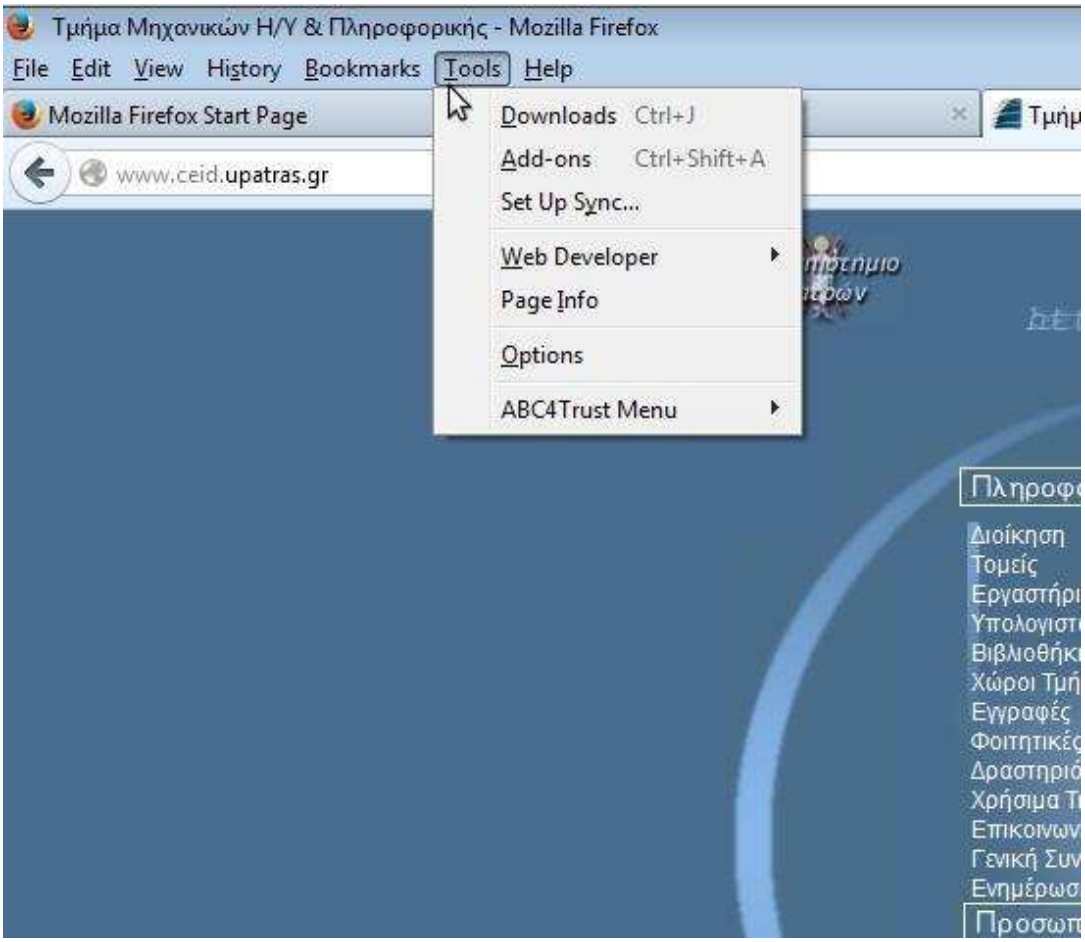

Figure 90: Web Browser Menu

How to Setup Your Web Browser - Step 5:

Now select the "Options" tab under the Tools Menu as Figure 91 shows

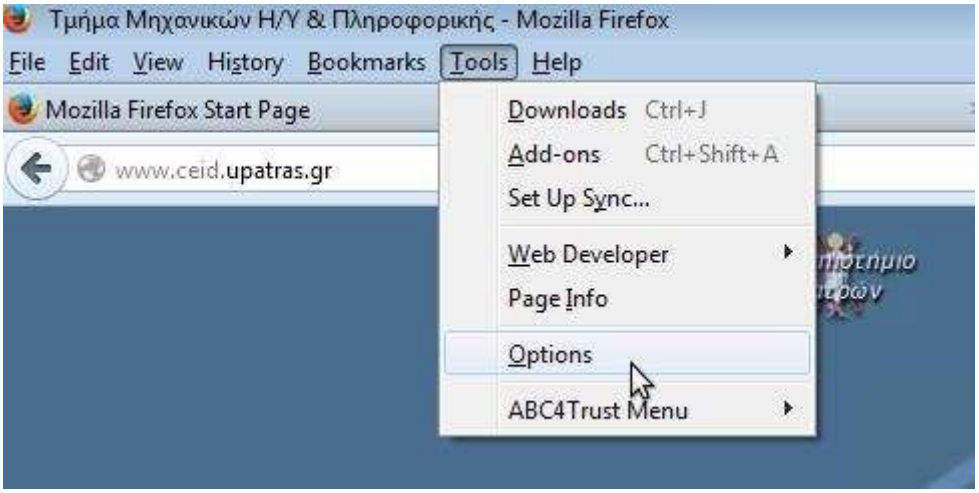

Figure 91: Web Browser's Options

How to Setup Your Web Browser – Step 6:

You will see the following options interface on your screen.

Now select the corresponding "Certificates" tab as shown in the following figure.

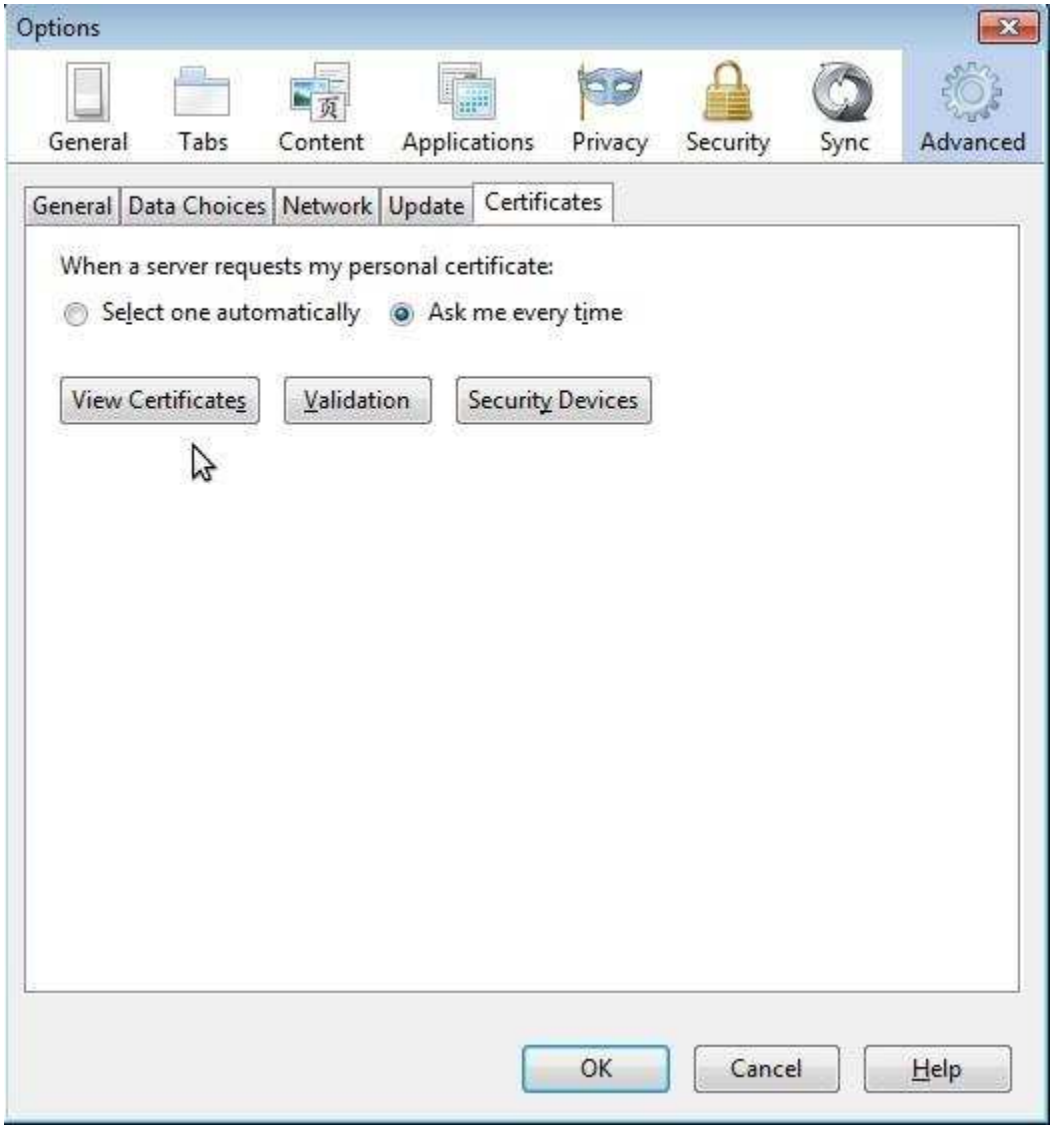

Figure 92: Bowser's Options Menu

How to Setup Your Web Browser – Step 7:

Please select "View Certificates" in the corresponding box as Figure 93 shows.

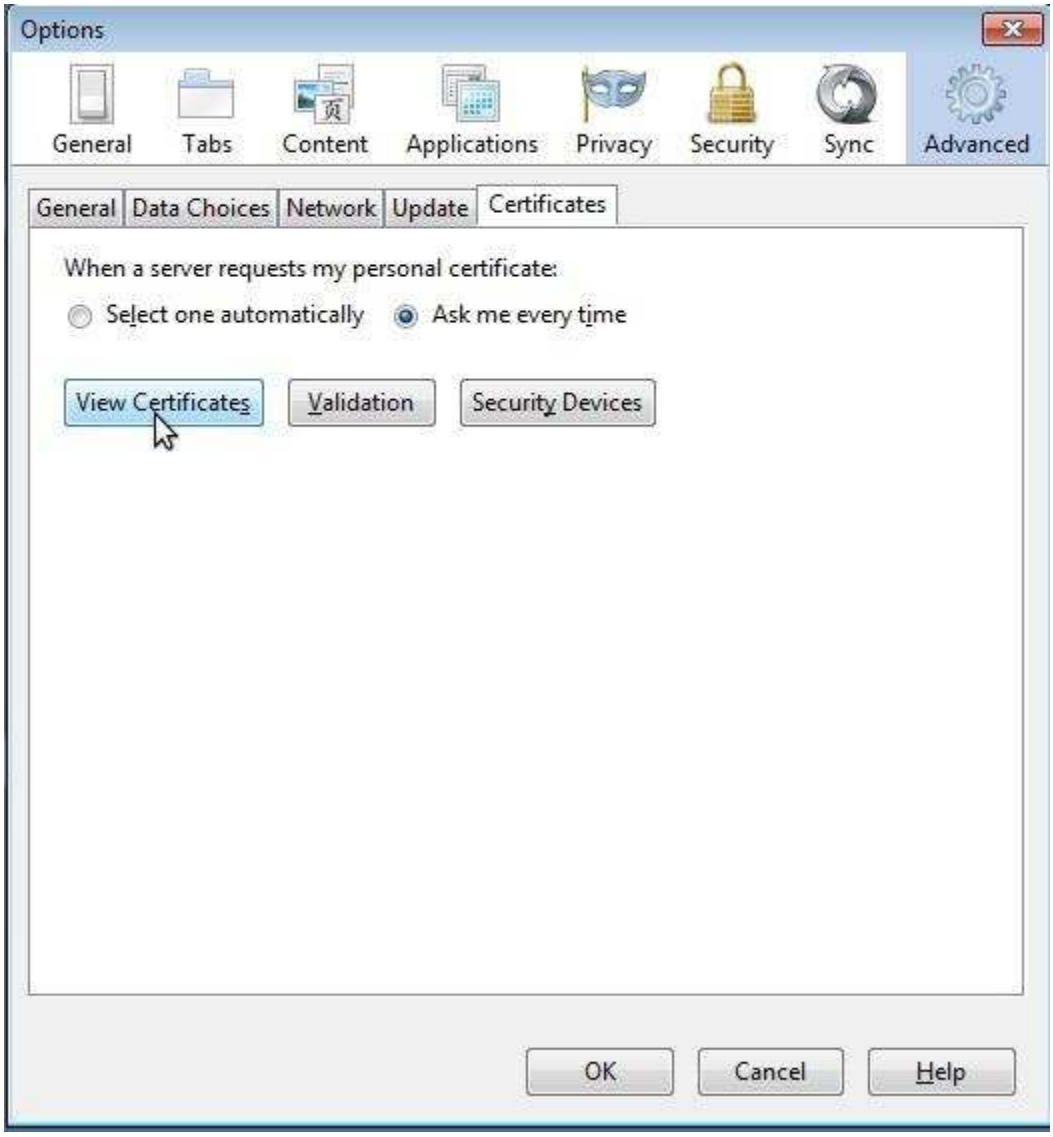

Figure 93: View Browser's Certificates

How to Setup Your Web Browser – Step 8:

Now the Certificate Manager application pops up. Click on the button "Add Exception" and add an exception for the link https://ces.cti.gr:8443/.

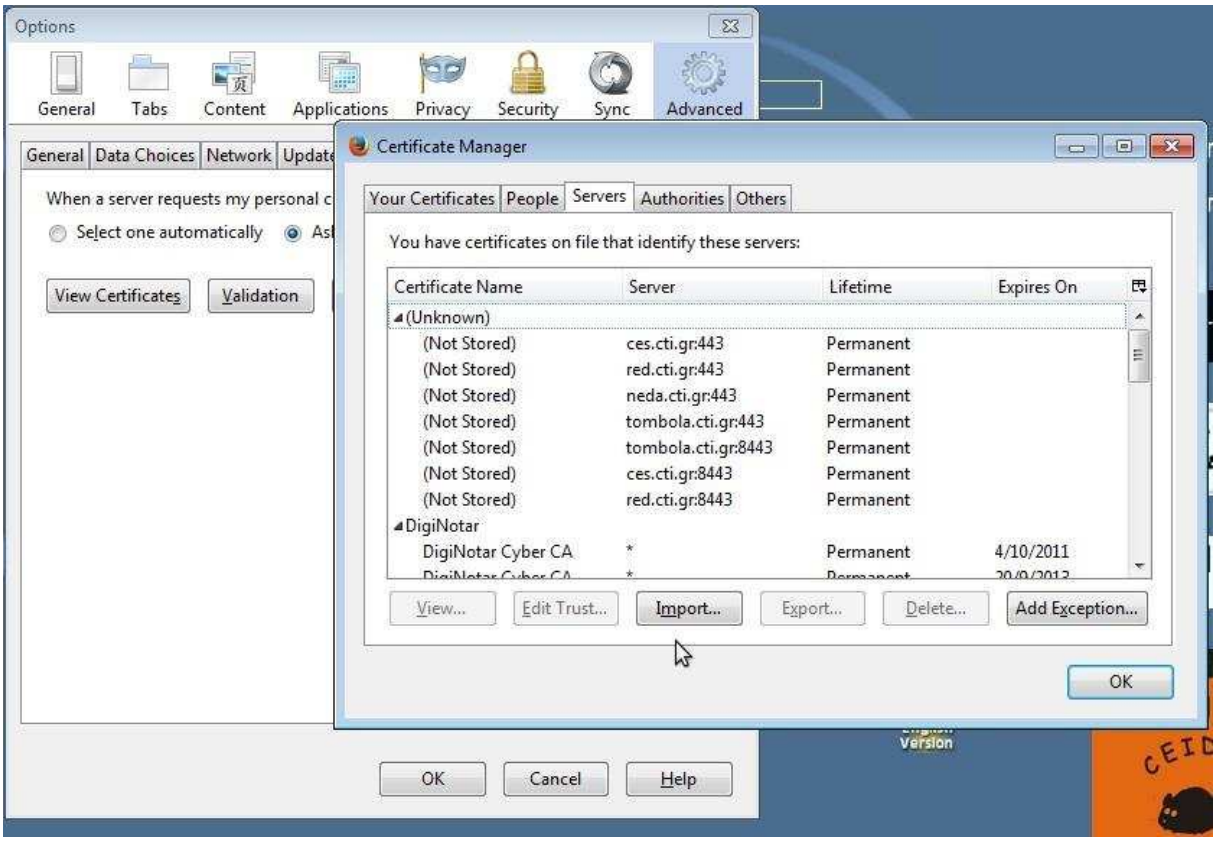

Figure 94: List of Servers' Certificates

Now, you are ready to interact with the Course Evaluation System and submit your evaluation for the course.

3.16.2 Evaluate the Course and Obtain a Tombola Credential

How to Evaluate a Course and Obtain a Tombola Credential - Step 1:

Plug the USB cable of card reader to your computer and place the smart card into the card reader as **Figure 95** shows.

Figure 95: Smart card reader

How to Evaluate a Course and Obtain a Tombola Credential - Step 2:

Visit the Course Evaluation System at https://ces.cti.gr/ in order to verify that the Course Evaluation process has begun. In that case, follow the menu tab "Course Questionnaires".

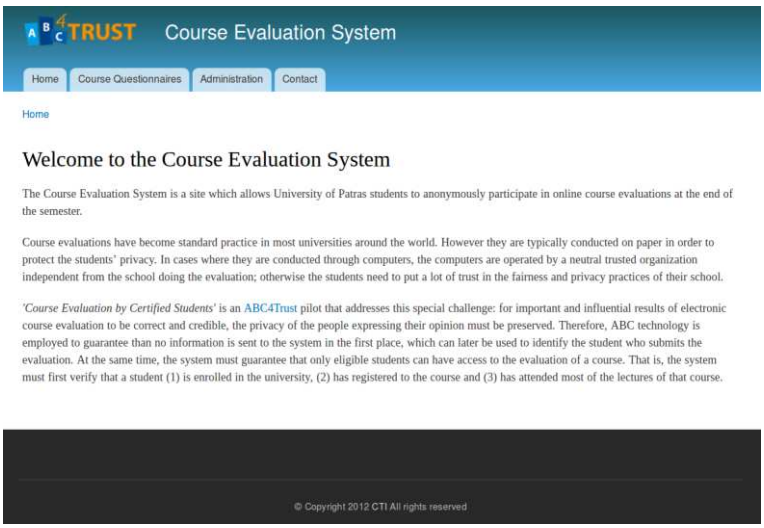

Figure 96: Course Evaluation System

How to Evaluate a Course and Obtain a Tombola Credential - Step 3:

On this page, please click on the "Log in" button. This calls the Firefox plugin and populates a window where you can choose which credentials to use for the verification process.

Figure 97: Course Questionnaires Login Page

How to Evaluate a Course and Obtain a Tombola Credential – Step 4:

The ABC4Trust User Service application requests your PIN in order to unlock the card. Please enter your PIN in the corresponding box as the following figure shows and click the "OK" button.

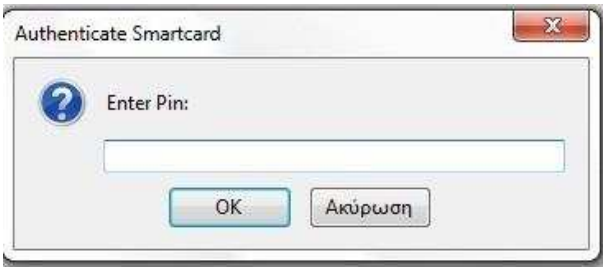

Figure 98: Smart Card PIN Authentication

How to Evaluate a Course and Obtain a Tombola Credential – Step 5:

Now the ABC4Trust Client application pops up and asks to select your policy for logging into the Course Evaluation System. The Identity Selector informs you that you will present:

- ☑ A pseudonym for the evaluation
- ☑ A University Credential
- ☑ A Course Credential

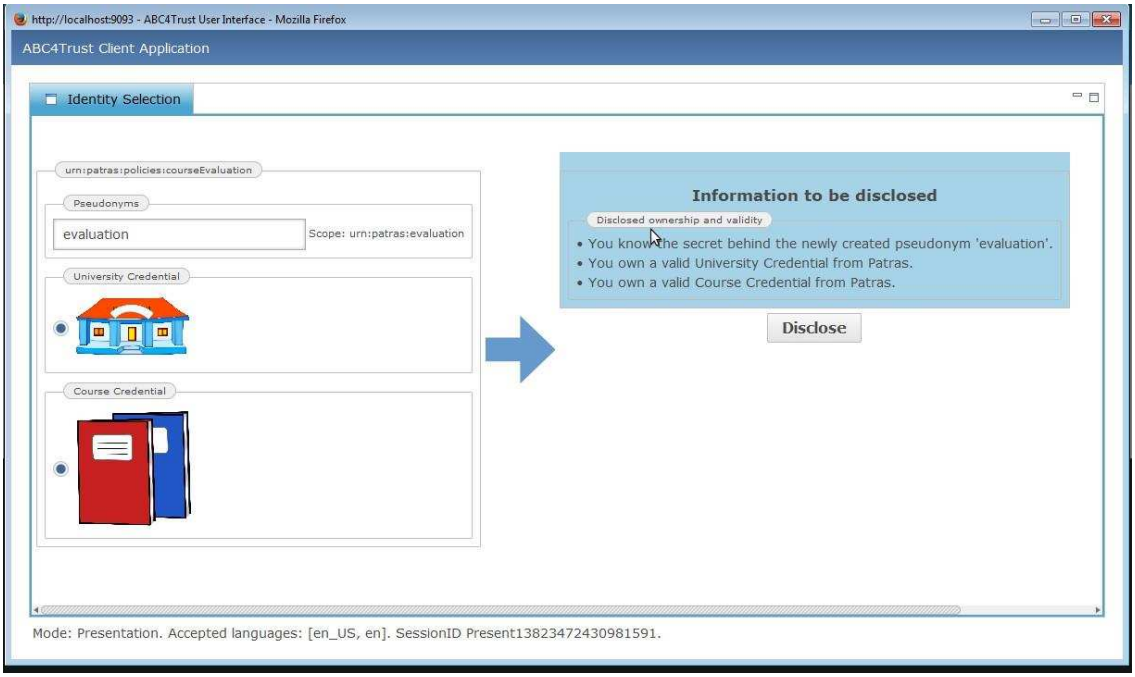

Figure 99: Course Evaluation System

How to Evaluate a Course and Obtain a Tombola Credential – Step 6:

Now if the verification process is successful you will see the following verification message.

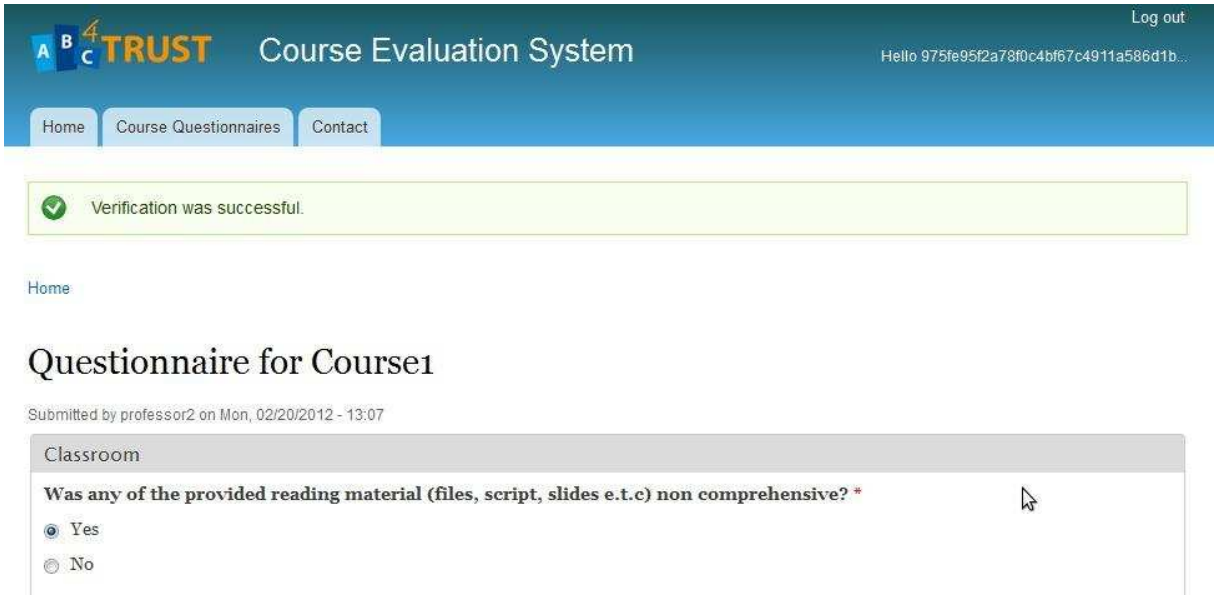

Figure 100: Verification Message

How to Evaluate a Course and Obtain a Tombola Credential – Step 7:

If the verification process is successful the questionnaire appears. In the end of each questionnaire there is a "Save draft" button which you can use in order to continue the course evaluation another time and not lose your answers

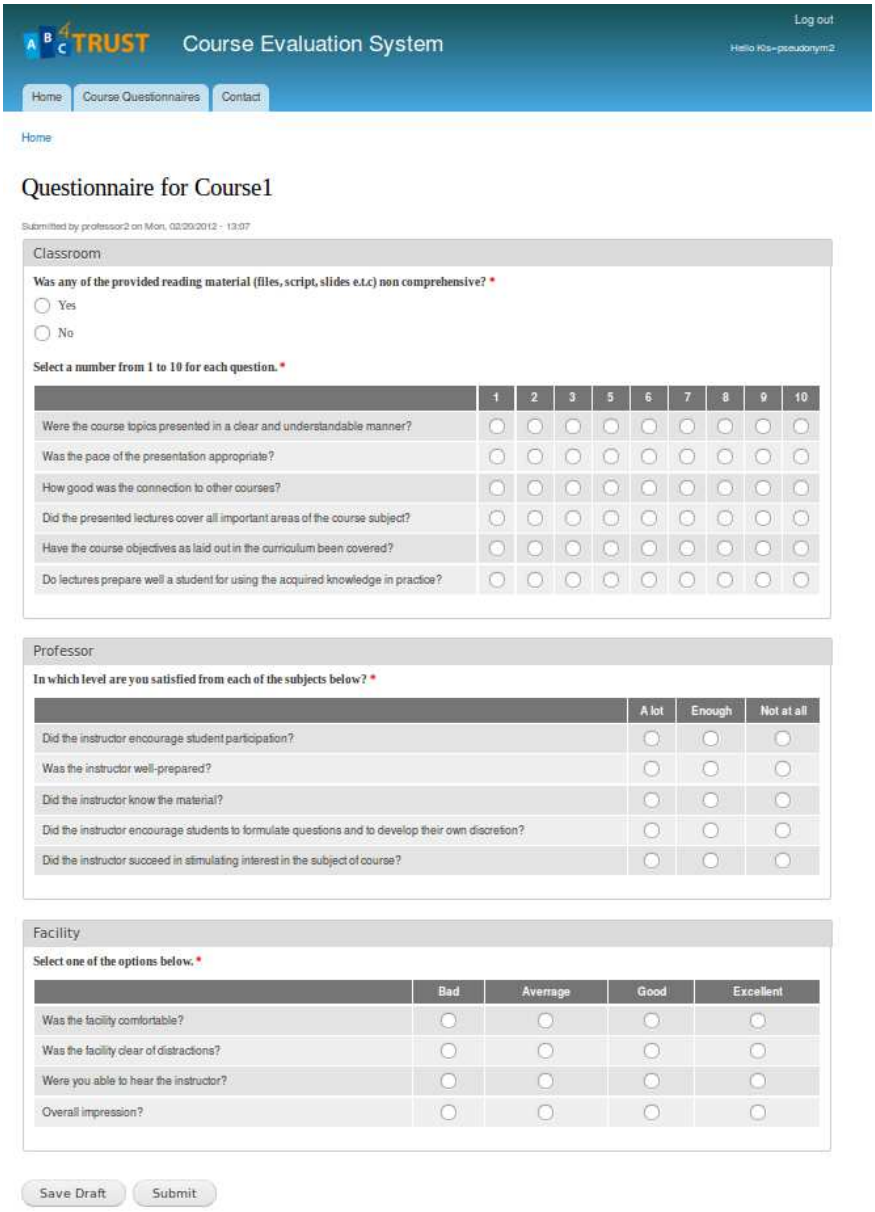

Figure 101: Questionnaire form

How to Evaluate a Course and Obtain a Tombola Credential - Step 8:

As soon as you submit your questionnaire for the course, you will be re-directed to the following page where you can obtain your Tombola Credential. Please, click on the button "Get Credential" in order to obtain your Tombola credential.

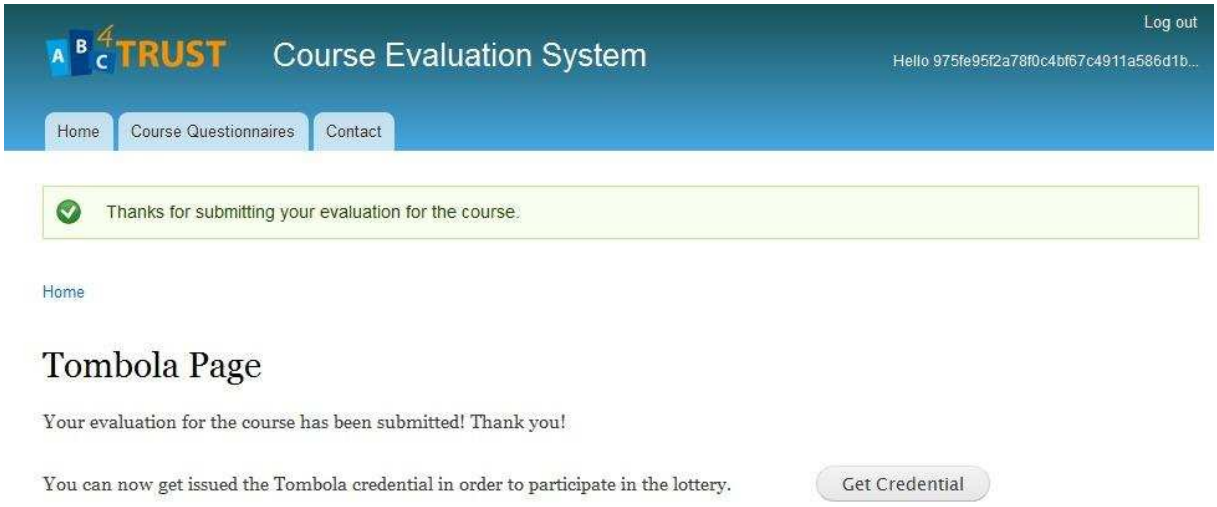

Figure 102: Get Tombola Credential

How to Evaluate a Course and Obtain a Tombola Credential - Step 9:

As soon as you press the "Get Credential" button the issuance protocol will start. The Identity Selector will pop-up and inform you that you will present:

- ☑ Your pseudonym for evaluation
- ☑ Your University Credential

Please, note that your matriculation number will be "blindly" carried over from your University Credential to the Tombola credential.

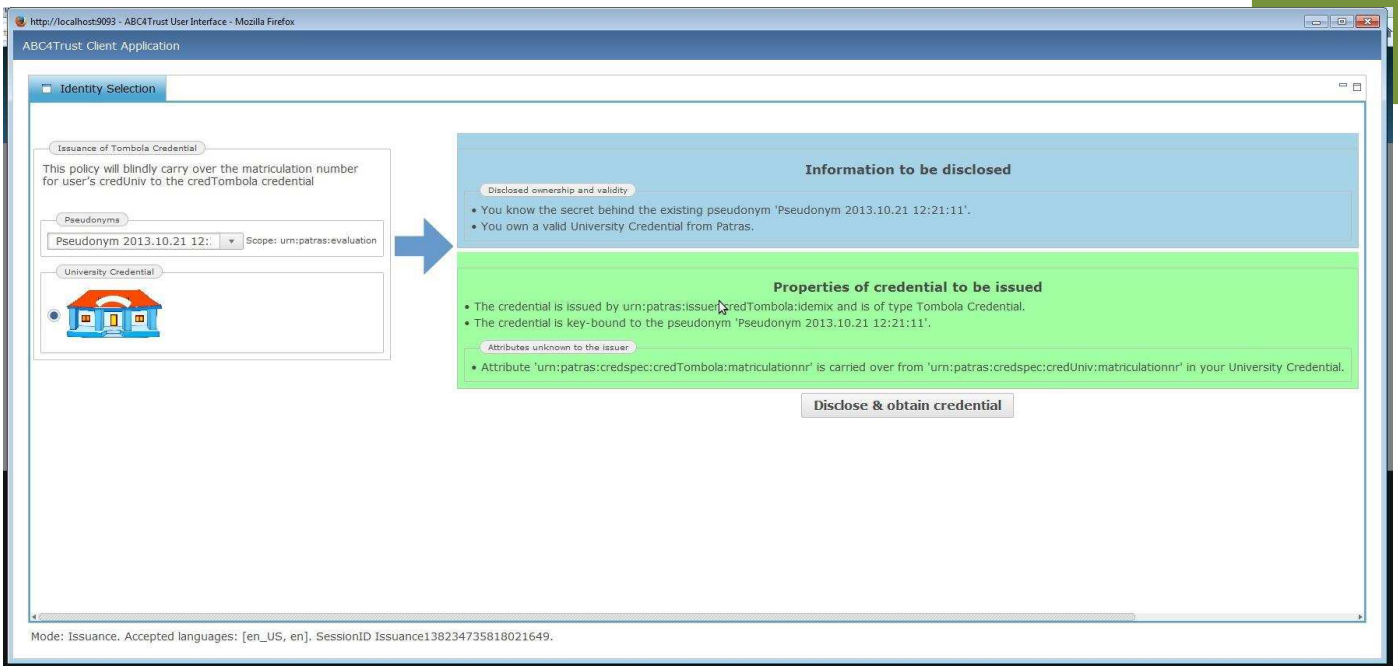

Figure 103: Identity Selector for Issuance of Tombola Credential

How to Evaluate a Course and Obtain a Tombola Credential - Step 10:

As soon as the issuance protocol is completed successfully you will be notified (Figure 104). Please, click the "OK" button.

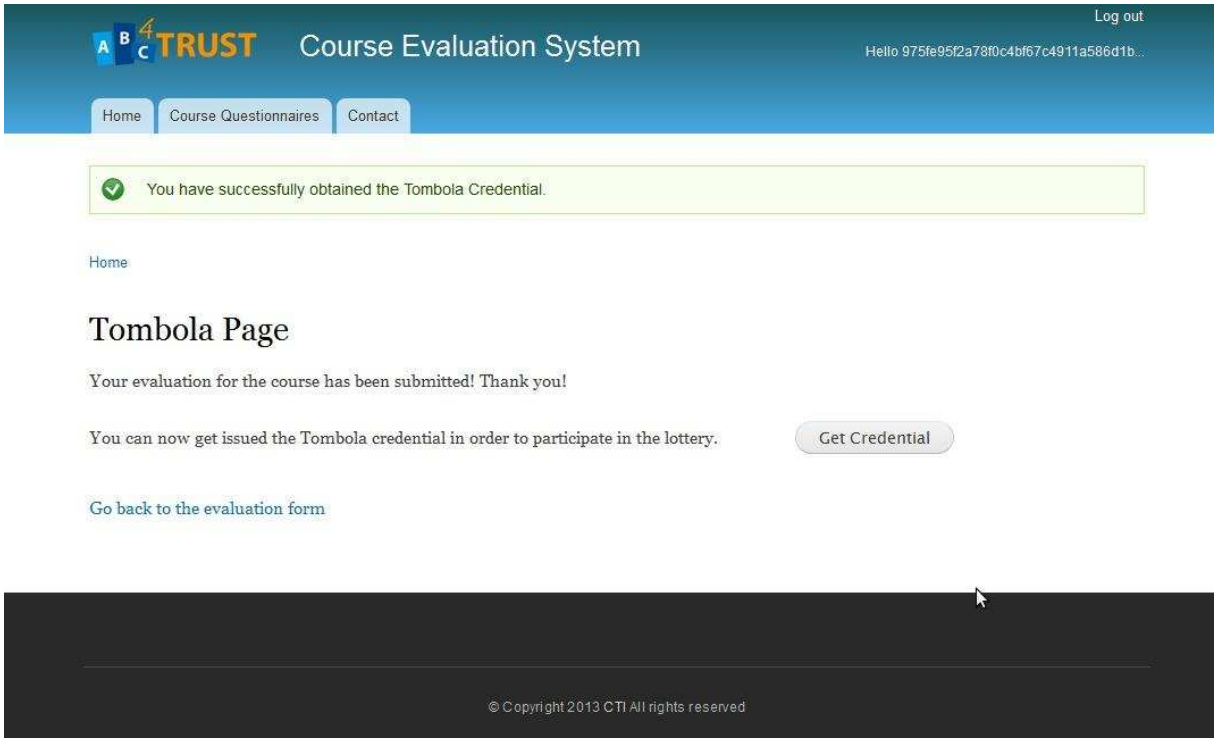

Figure 104: Issuance of Tombola Credential was Successful

How to Evaluate a Course and Obtain a Tombola Credential - Step 11:

To make sure that you have obtained your Tombola Credential you can browse your Credential Manager as in Figure 105.

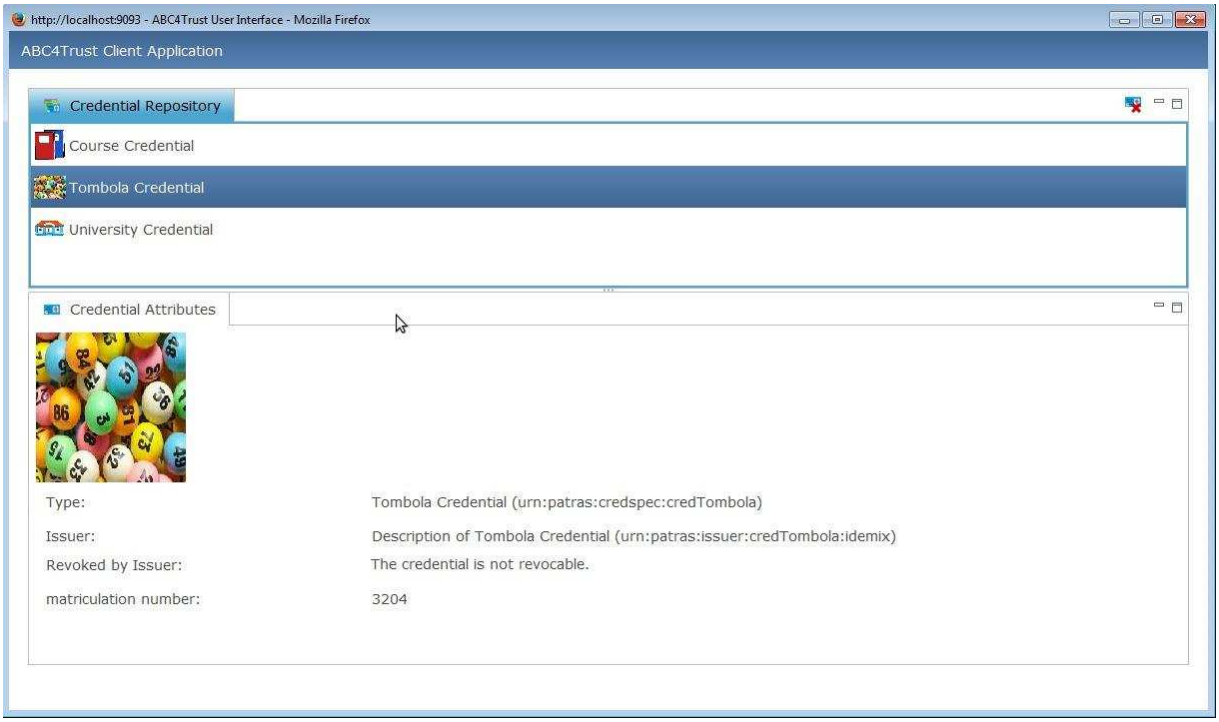

Figure 105: Credential Manager View after Obtaining the Tombola Credential

How to Evaluate a Course and Obtain a Tombola Credential - Step 12:

In case you want to change your evaluation for the course, you can follow the link "Go back to the evaluation form" which will prompt you to the course questionnaire page. There, you will get informed that you have already submitted your evaluation.

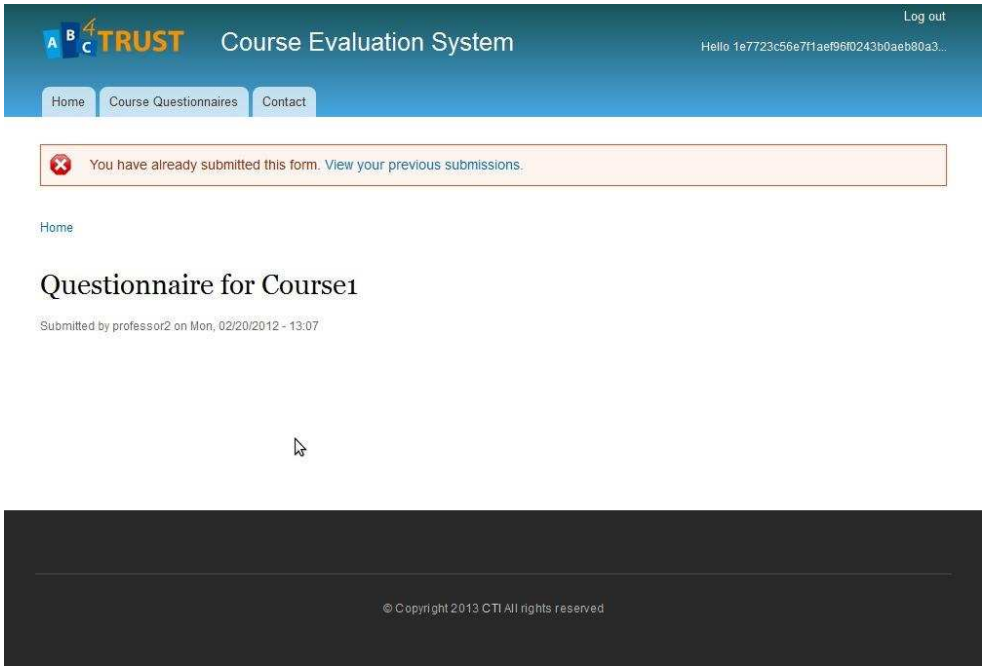

Figure 106: Course Questionnaire Page After Submission

How to Evaluate a Course and Obtain a Tombola Credential - Step 13:

If you follow the link to the Course Questionnaire page, you can visit your submission so as to edit or view it.

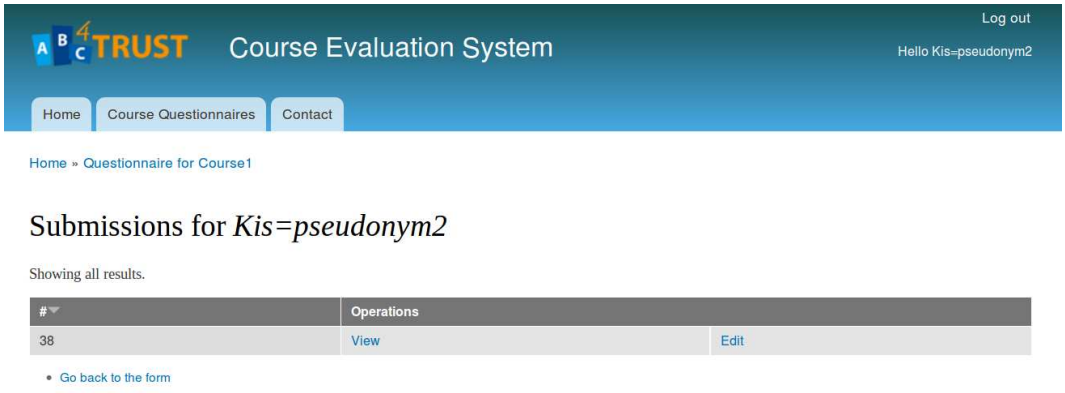

Figure 107: Questionnaire Editing Option

How to Evaluate a Course and Obtain a Tombola Credential - Step 13:

After finishing your interaction with the Course Evaluation System, please *"Log out"* and pull the card out of the Reader. For any problems or further information you can visit the "Contact" page to find the contact details.

3.16.3 Troubleshooting for Evaluating a Course and Obtaining a Tombola Credential

- If you cannot log in at the Course Evaluation System you need to make sure that you have a valid University Credential and a Course Credential
- If you cannot log in at the Course Evaluation System you need to make sure that you have sufficient attendance units (see Section 3.9)
- If you get a message "Could not contact verification service" you need to follow the instructions of Section 3.16.1 and add the a security exception for the link https://ces.cti.gr:8443

3.17 How to Join the Tombola Lottery

As soon as you submit your evaluation for the course and obtain the Tombola credential you can register yourself for the online lottery that raffles the special prize.

Note:

- **You must have submitted the course questionnaire and obtained your Tombola credential (see Step 13 in Section 3.16)**
- **You must have installed the ABC4Trust service at your computer.**
- **You have to plug the USB cable of card reader to your computer and place the smart card into the card reader.**

3.17.1 Setup Your Browser Before Accessing the Tombola System

This phase describes the necessary steps you should follow in order to setup your web browser before interacting with the Course Evaluation System.

How to Setup Your Web Browser - Step 1:

Please visit the Tombola System at https://tombola.cti.gr/. Now, you will see the following notification and follow the "I Understand the Risks" link.

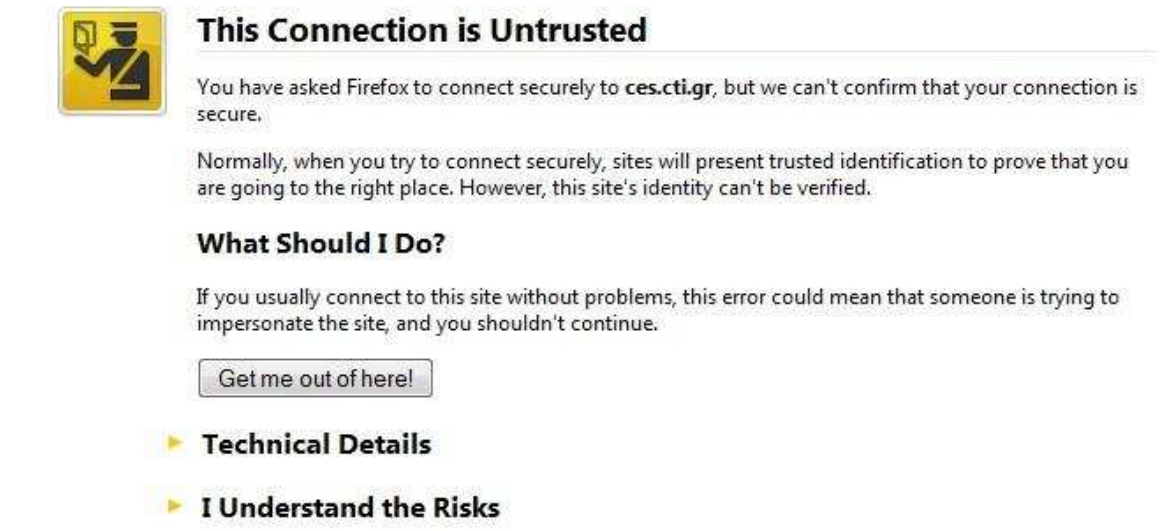

Figure 108: Add CES Certificate

How to Setup Your Web Browser - Step 2:

Now you can see the following interface and you must select the "Add Exception" tab at the bottom of the window as **Figure 109** shows.

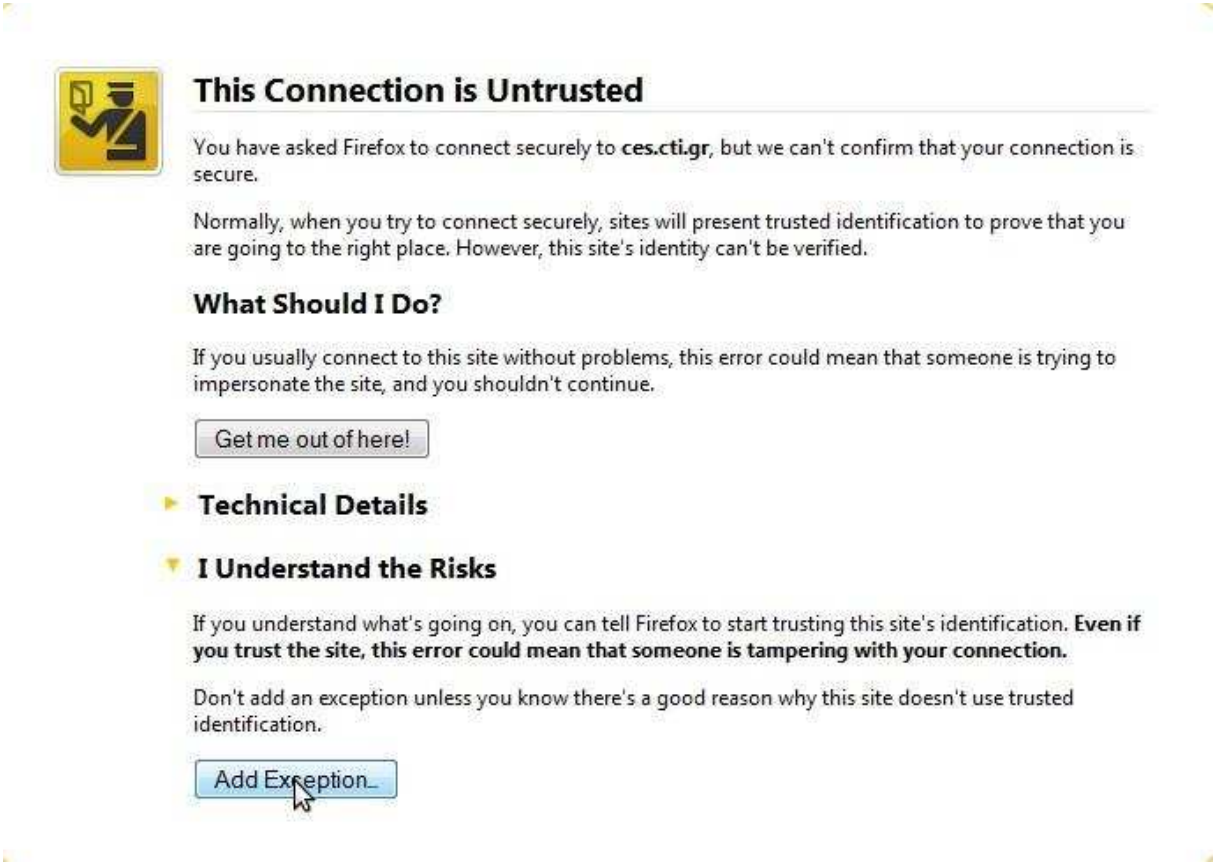

Figure 109: Add Exception

How to Setup Your Web Browser - Step 3:

Please click on the "Get Certificate" button and then click on the "Confirm Security Exception" button. The front page of the Tombola System will now appear.

Figure 110: Add Security Exception

Additionally, you need to add manually a security exception for the link https://tombola.cti.gr:8443/. Please, follow the instructions below:

How to Setup Your Web Browser - Step 4:

Open your Firefox browser. You will see the following interface on your screen. Follow the tab "Tools" or "Εργαλεία" at your Firefox browser menu.

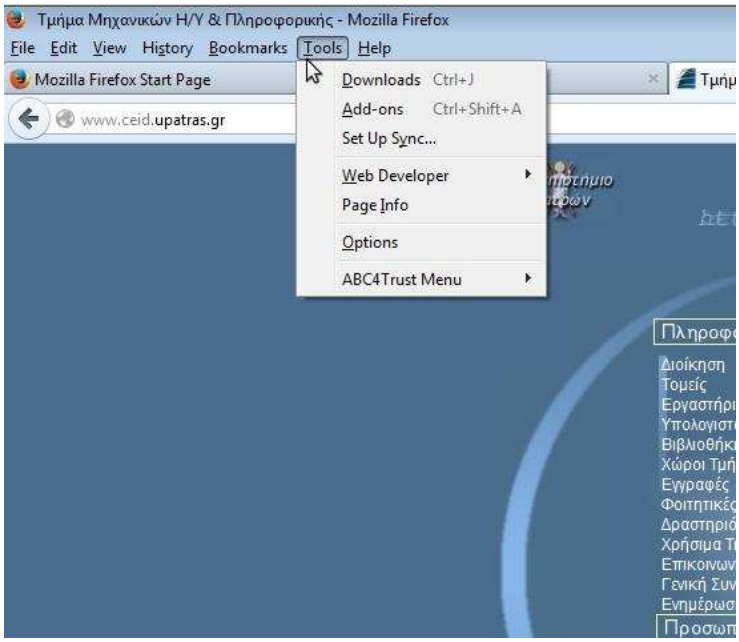

Figure 111: Web Browser Menu

How to Setup Your Web Browser - Step 5:

Now select the "Options" tab under the Tools Menu as Figure 112 shows

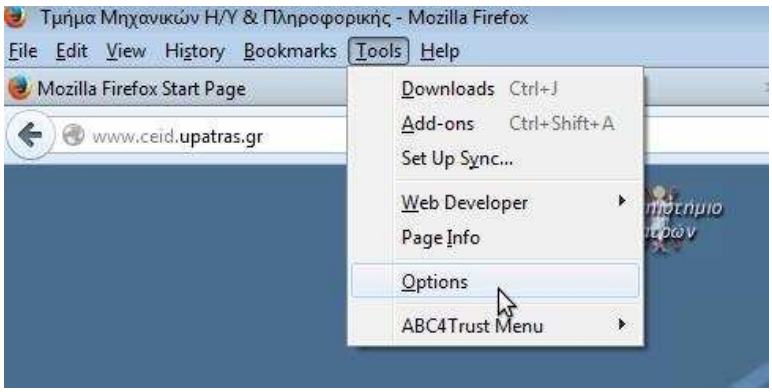

Figure 112: Web Browser's Options

How to Setup Your Web Browser – Step 6:

You will see the following options interface on your screen.

Now select the corresponding "Certificates" tab as shown in the following figure.

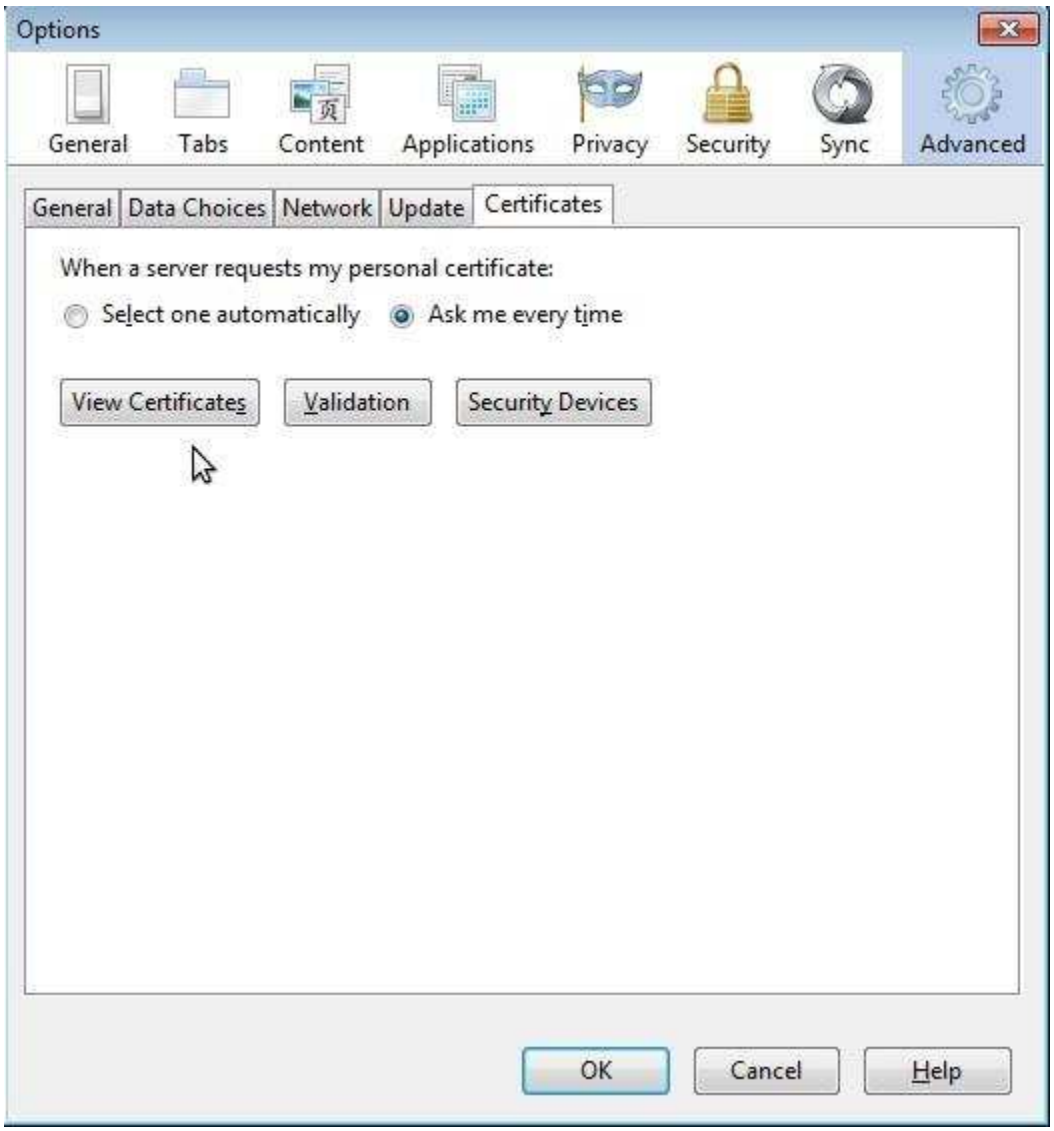

Figure 113: Bowser's Options Menu

How to Setup Your Web Browser – Step 7:

Please select "View Certificates" in the corresponding box as Figure 114 shows.

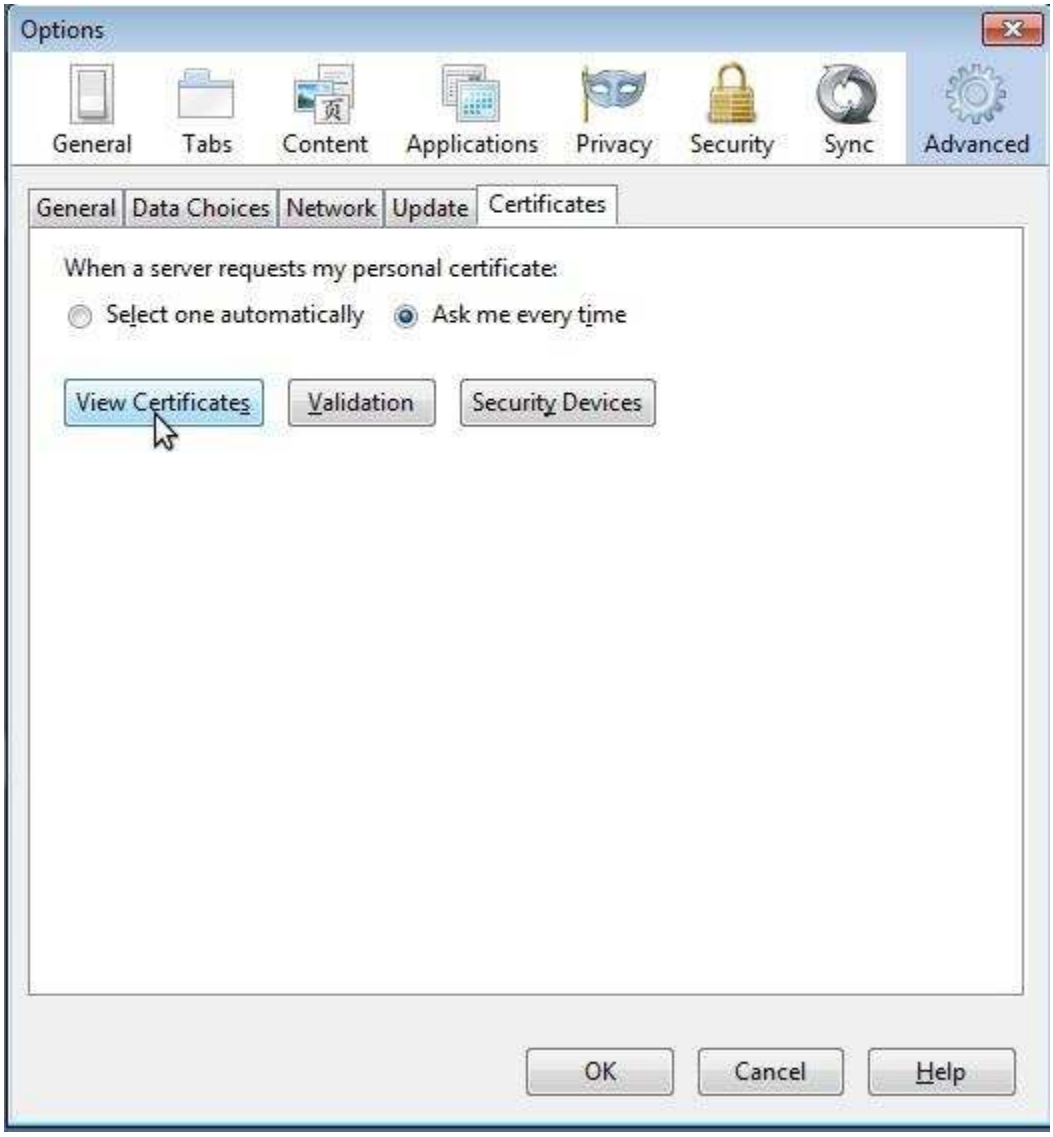

Figure 114: View Browser's Certificates

How to Setup Your Web Browser – Step 8:

Now the Certificate Manager application pops up. Click on the button "Add Exception" and add an exception for the link https://tombola.cti.gr:8443/.

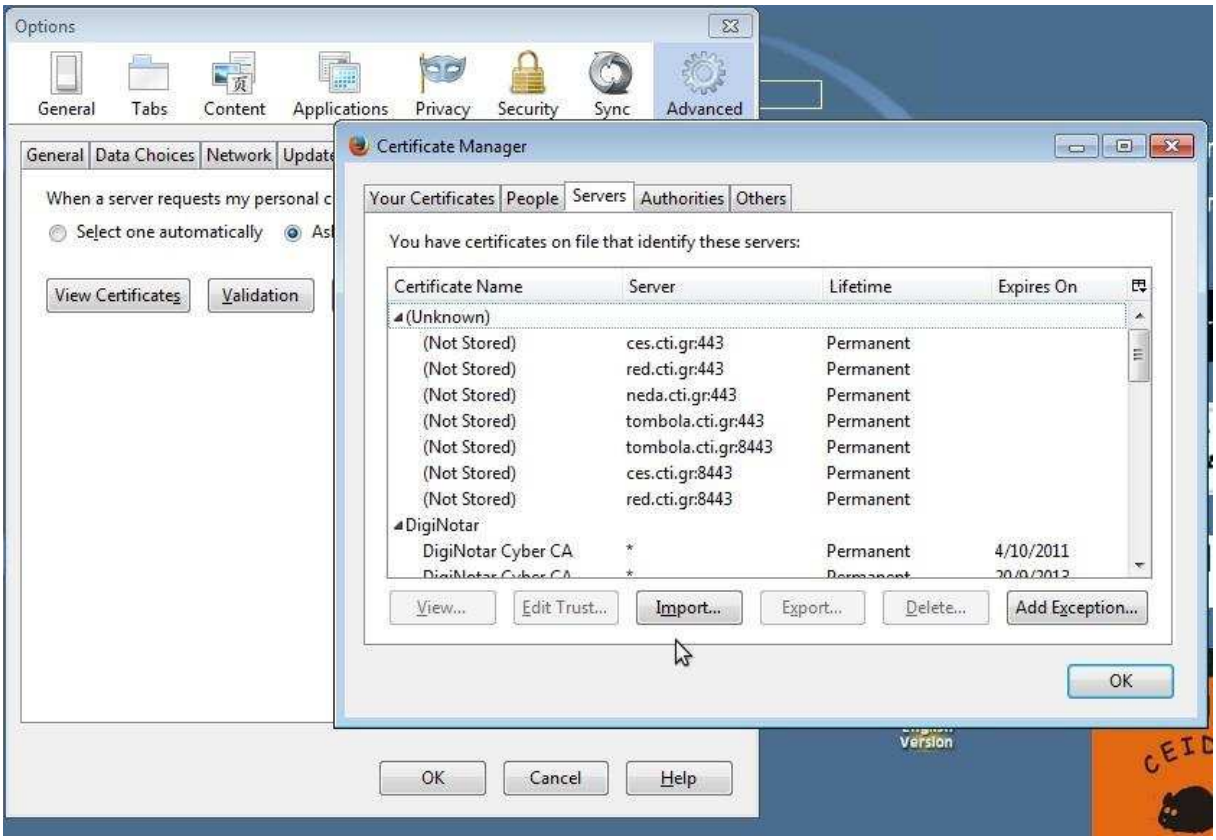

Figure 115: List of Servers' Certificates

Now, you are ready to interact with the Tombola System and register for the online lottery.

3.17.2 How to Join the Tombola Lottery

How to Join the Tombola Lottery - Step 1:

Plug the USB cable of card reader to your computer and place the smart card into the card reader as **Figure 116** shows.

Figure 116: Smart card reader

How to Join the Tombola Lottery - Step 2:

Please, visit the Tombola web Page at the link https://tombola.cti.gr in order to verify that the Lottery game process has begun.

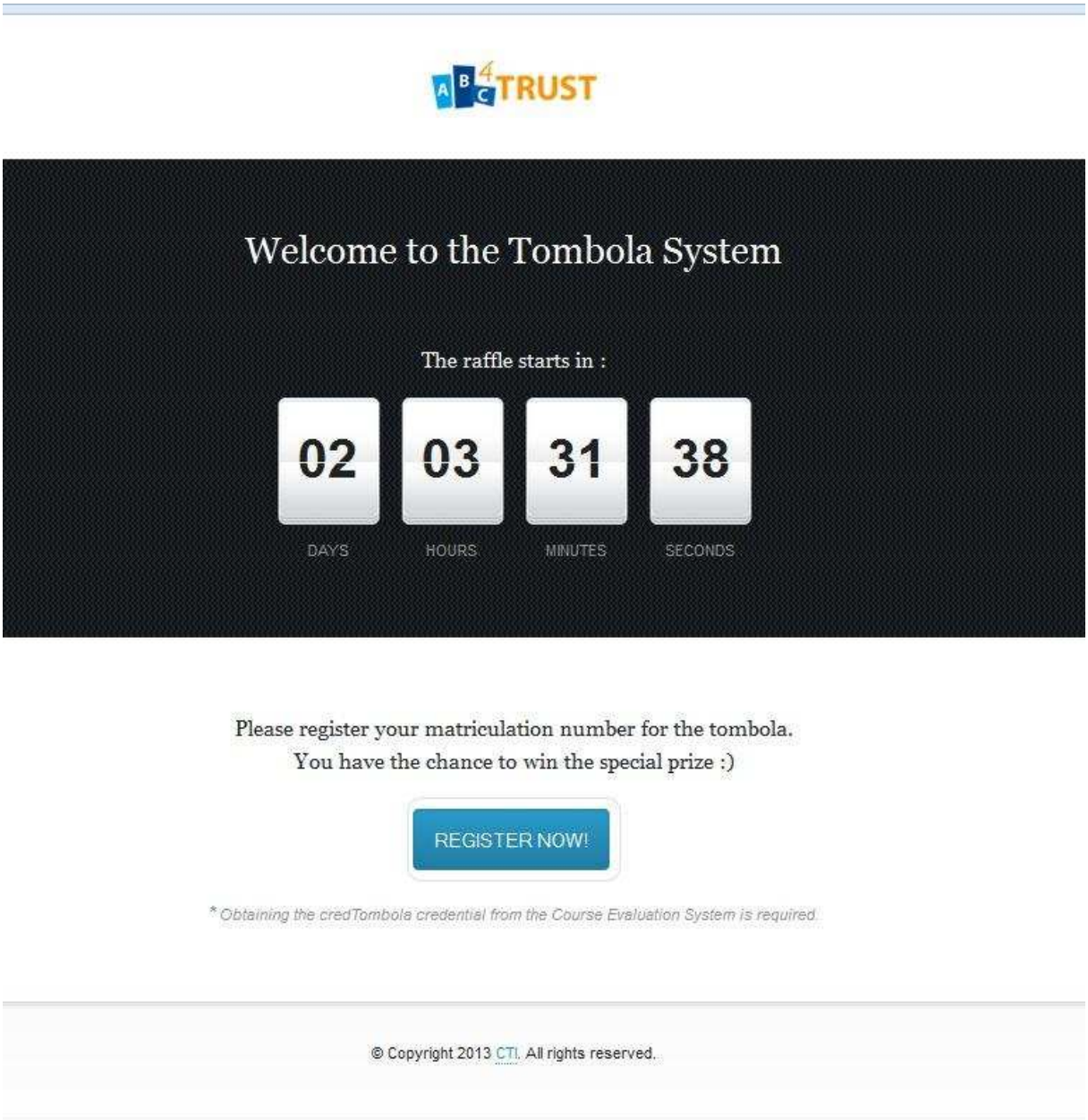

Figure 117: Tombola Page

How to Join the Tombola Lottery - Step 3:

On this page, please click on the "*Register Now"* button. The verification process will take place.

How to Join the Tombola Lottery – Step 4:

The ABC4Trust User Service application requests your PIN in order to unlock the card. Please enter your PIN in the corresponding box as the following figure shows and click the "OK" button.

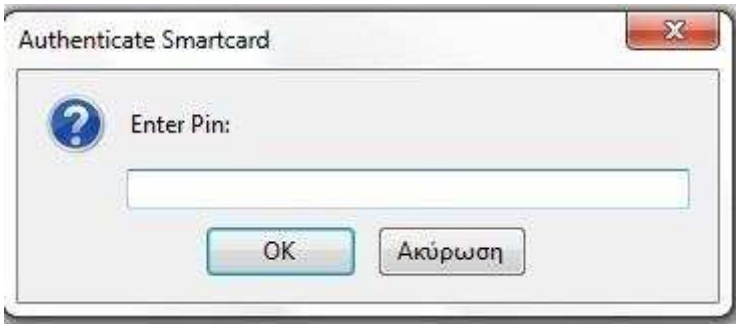

Figure 118: Smart Card PIN Authentication

How to Join the Tombola Lottery - Step 3:

As soon as you enter your PIN, the Firefox plugin populates a window where you can choose which credentials to use for the verification process. The Identity Selector informs you that you are about to present:

- ☑ A pseudonym for the tombola
- ☑ Your Tombola Credential

Please, note that your matriculation number will be encrypted with the Inspector's public key. The inspector will reveal only the matriculation number of the winner.

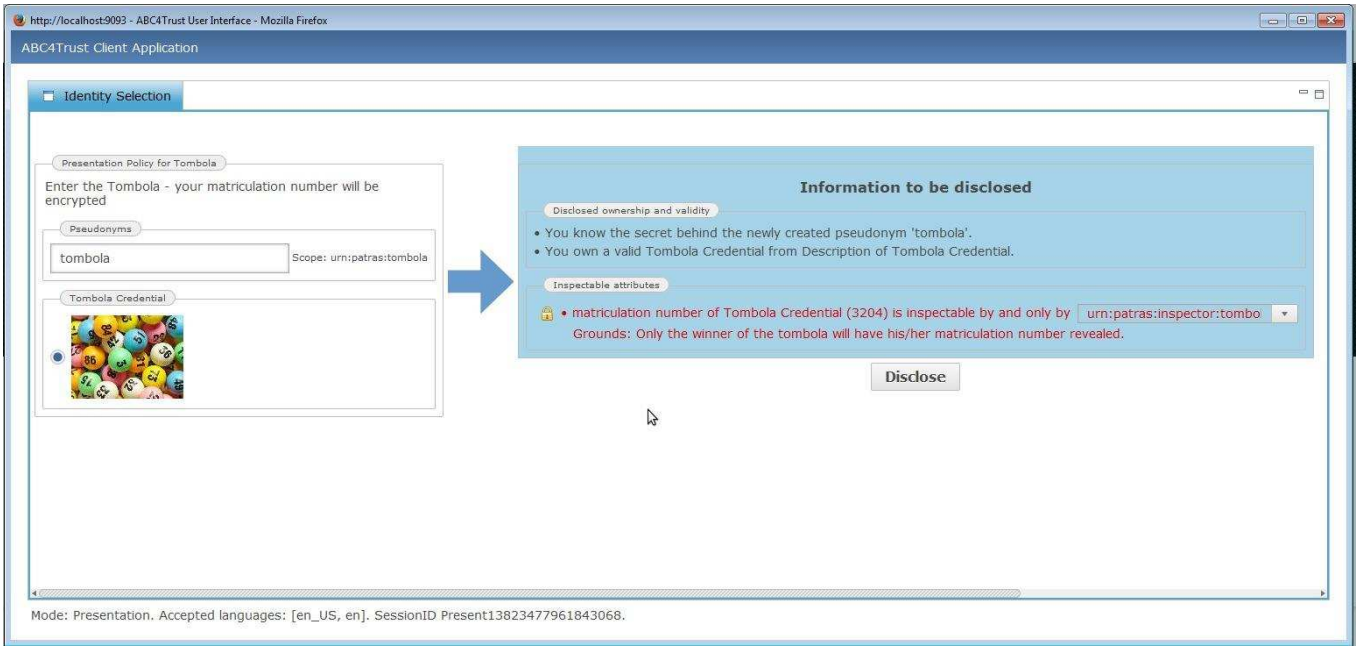

Figure 119: Tombola System

How to Join the Tombola Lottery – Step 4:

If the verification process is successful you get the corresponding message as show on Figure 120. You are now registered for the lottery. Good Luck!

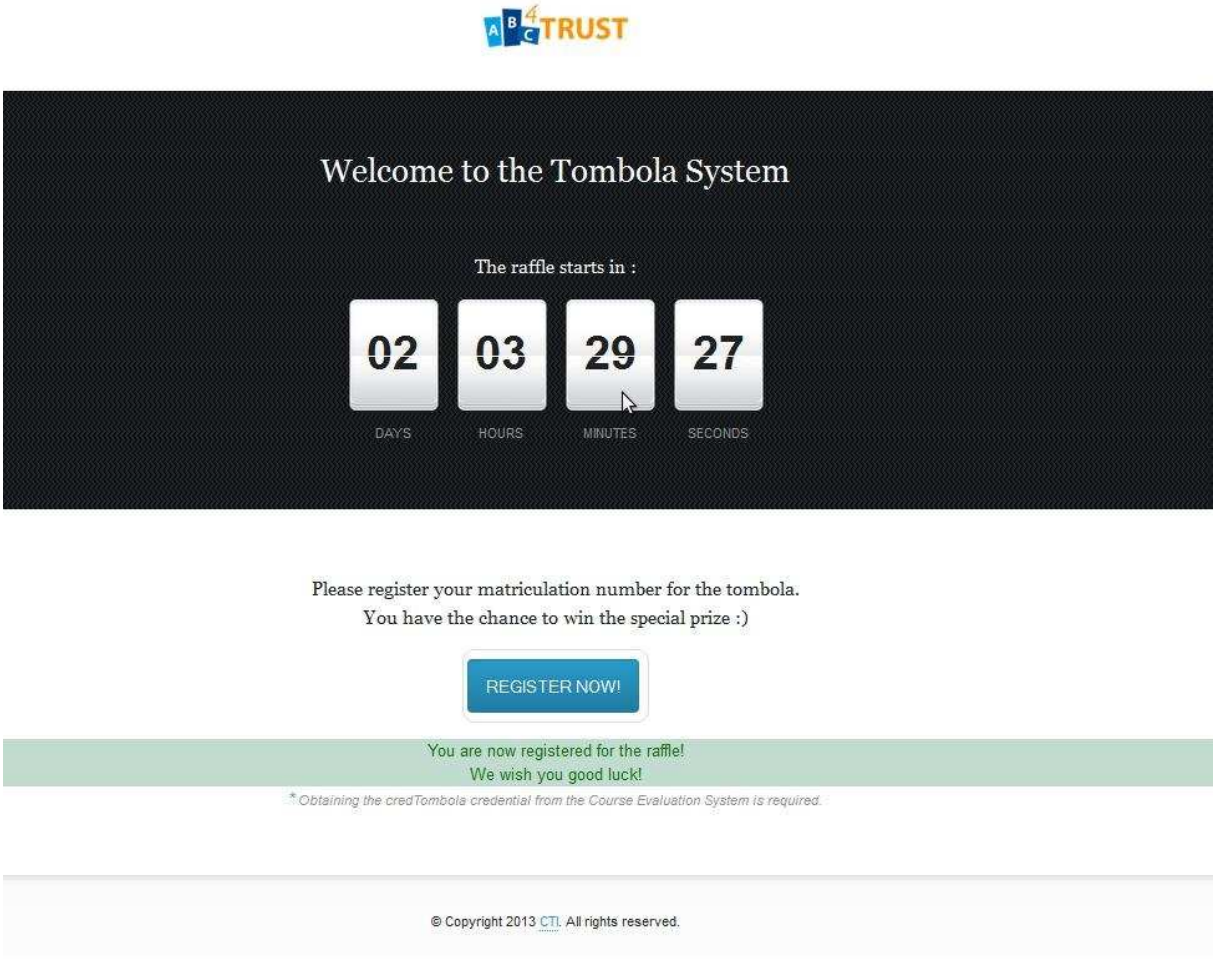

Figure 120: Successful Registration for the Lottery

3.17.3 Troubleshooting for Joining the Tombola Lottery

- If you cannot register for the lottery, please make sure that the lottery has not ended.
- If you cannot register for the lottery, please make sure that you have obtained a Tombola credential from the Course Evaluation System
- If you get the message "Could not contact verification service", you need to follow the instructions of section 3.17.1 and add a security exception for the link https://tombola.cti.gr:8443
- If you try to register multiple time for the lottery, you will get a message "You have already been registered for the raffle"